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BRAITHWAITE'S RETROSPECT.

VOL. LXXIV. JULY—DECEMBER. 1876.

THE

RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.

AND

JAMES BRAITHWAITE, M.D.LOND.

LECTURER ON DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE.
ASSISTANT-SURGEON TO THE LEEDS HOSPITAL FOR WOMEN AND CHILDREN.

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(ARRANGED ALPHABETICALLY), CONTAINING

A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, SHOWING AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE HALF-YEAR.

AFFECTIONS OF THE SYSTEM GENERALLY.

ALCOHOL AS A FOOD IN FEVER CASES. — I have convinced myself by a series of experiments that alcohol is completely destroyed in the animal organism. If pure it leaves no taint upon the breath, and where this is present it is attributable to some of the ethers or fusel oil. Thus, in the experiments referred to, I found only traces. Such being the case, it is evident that every molecule of alcohol burned within the system must yield, not only warmth, but that power to accomplish work with which the development of caloric is always accompanied. It would be unreasonable to suppose that the vital powers of the patient are kept up solely by the stimulating properties of the alcohol, for the nervous system and heart require nourishment as well as any of our other organs, and they cannot be kept going so long by stimulants alone. On the contrary, by so urging them on to activity day after day, without supplying any food to compensate for the wear and tear resulting from such augmented action, it is certain that we should exhaust their forces more quickly than by any other plan of proceeding. Alcohol certainly acts as a stimulant in conditions of extreme weakness, but given for days together when no other combustible material is being supplied to the system, it burns in the tissues, and by means of the heat thus generated, furnishes the body with warmth and the strength necessary to carry on its vegetative functions. One of the most difficult points for the practititioner is to procure a form of alcoholic beverage that is quite free from fusel oil. Now, if we introduce into the system of a sick man any alcoholic mixture in which fusel oil is contained, the evil effects produced by the latter upon the brain, in this case already weakened by disease, will manifest themselves yet more strongly than they would upon a healthy one; and just here lies the great practical difficulty, the "hidden reef," so to speak, for the therapeutic use of alcohol. How then is the physician to meet this difficulty? There are two

ways open. First, he may employ in his practice only the pure spirit of wine, from which, largely diluted with water, he causes to be prepared a palatable drink, containing in addition sugar and some innocent aromatic substance. (Dr. C. Binz, p. 21.)

CANCER.—The application of stramonium ointment was found to give great relief to pain. Mr. Henry Morris had good result in a severe case of epithelioma, involving nearly half the scalp, with "Fell's Paste" (chloride of zinc, flour, and liquor opii sedativus, sufficient to form a paste). The first application produced an eschar, which was cut through so that the remedy could be applied deeper, and applications having been made daily, or on alternate days for about a month, the whole mass came away leaving the bone exposed: finally, a thin sheet of this exfoliated, the wound healed, and the patient has remained well for several months since. Mr. Morris had also a severe case of prolapsus of the rectum cured by longitudinal stripes from the galvano-cautery. (Brit. Med. Journal, Aug. 19, p. 237.)

ENTERIC FEVER.—*The Cold Bath Treatment.*—The method employed in the administration of the cold bath is as follows: An ordinary plunge bath is filled with water of the desired temperature. The patient, previously enveloped in a dressing-gown, is wheeled from the ward into the bath-room, bed and all, on a bed carriage, placed alongside the bath, and lifted into it by two attendants. The whole of the body is kept constantly under water, with the exception of the face, which is sponged with water of the temperature of the bath, and the mouth is thoroughly cleansed of all sordes and filth which collect on the gums, tongue, and teeth. We do not retain a patient, as a rule, longer than fifteen minutes in a bath of temperature 75° reduced to 65°, or ten minutes in a bath of 65°. We generally employ baths of the latter temperature, as they are borne well by patients, although in some cases, children especially, we find it advisable to employ baths of temperature of 80° reduced to 70°. It is necessary, in most cases, to administer stimulants to the patients while in the bath, owing to the tendency the cold has to cause failure of the heart's action. It has been the practice at Homerton, whilst regarding the indications afforded by the temparature as of great value, not to consider it the only or the chief indication; that when a patient with the above temperature sleeps fairly, has slight delirium and no marked restlessness, the bath is not administered, but when these symptoms are well marked and persistent, and accompany that temperature, or if they are present with a lower temperature a bath

is considered advisable. Indeed we may say that we have found the best results from the administration of a bath in a temperature slightly over 100°. when accompanied by the symptoms we have mentioned. Important as is the effect of the bath on the temperature, of equal if not greater importance is its effect on the symptoms referable to disturbance of the nervous system. In all cases it diminishes restlessness and delirium; in the great majority it produces sleep, and that too after the patient has passed many delirious and sleepless days and nights, and even should it fail to induce sleep, almost without exception, after its administration, the patient dozes quietly for some hours. Sleep, as a rule, follows within an hour, and continues, in some cases, two or three hours, in some three or four, and in others even five hours or longer. (Dr. J. Mc Combie, p. 346.)

GOUT.—*Prevention of.*—A very gouty old gentleman told me that by two methods he had succeeded in warding off an attack for a long time. The first of these was to drink a large quantity of water early in the morning. "Too little water," said he, "is a great cause of gout; and whenever you get gouty patients in the upper classes, always ask them how much water they drink. You will generally find that they tell you, We take a small cup of tea in the morning, and a small cup of coffee at night; and this is all the water they take, except what they get in the shape of wine and beer, or brandy and soda. Water, pure and simple, many of them never touch; in such persons gout may often be warded off by simply washing out their tissues. Give them a large draught of water the first thing in the morning, and make them take more water and less wine at meals. But if this is not enough, and the gout still threatens, give them 30 grains of bicarbonate of potash, and 20 of nitrate, in a large tumbler of water."—(Dr. Lauder Brunton, Practitioner, Sept., p. 197.)

RHEUMATIC FEVER.—*Salicin.*—I have used salicin or salicylic acid in every case of acute rheumatism which has come under my care since November, 1874 (a year and a half), and invariably with the same result—a rapid cure of the disease. Seeing a patient suffering from acute rheumatism, I have no hesitation in assuring him that within forty-eight hours, possibly within twenty-four, he will be free from pain. Salicin is a pleasant bitter, and is best given mixed with a little water, flavoured with syrup of orange if desired. In adequate dose—say fifteen grains every two hours—it cuts short an attack of rheumatic fever, without producing disagreeable effects. It should be continued in smaller doses during the first fortnight of convalescence. As remedial agencies

in acute rheumatism, salicin and salicylic acid seem to be equally efficacious; but the former has the advantage of producing no unpleasant effects. In time, too, it is sure to be much cheaper: a matter of some importance with a large class of sufferers from rheumatism. In not one case of acute rheumatism have I found salicin fail to produce a speedy cure of the disease. I have therefore nothing to add to, nothing to detract from, the conclusion—"that, given in sufficient dose at the commencement of the attack, salicin seems to arrest the course of acute rheumatism as effectually as quinine cures an ague, or ipecacuanha a dysentery." The dose of salicin is from ten to thirty grains every two, three, or four hours, according to the severity of the case. Fifteen grains every three hours is a medium dose for an acute case. It is very possible that less might suffice; for I have not tried to find the minimum dose. It is very certain that a much larger dose may be given without producing discomfort. Further experience has led me to the conclusion that it is well to give the larger dose; and that the best way to get the full and speedy benefit of the remedy is to saturate the system with it as quickly as possible. The more speedily this is done, the more speedily are the fever and pains subdued. I now, therefore, give the salicin to adults in a dose of twenty to thirty grains every two hours; in very acute cases I give that quantity every hour till pain is relieved. With relief of pain, sleep returns, and the hourly dose cannot be adhered to. But it is well to give twenty grains, at least, every two hours during the day, till the temperature is down to the normal. For a week afterwards the same dose should be given four times a day. Salicin is an excellent bitter tonic—in my experience as good as quinine, and not apt to disagree as the latter is. I have always found cases of acute rheumatism treated by it convalesce very rapidly; treated in the old way, convalescence from that disease is a slow and tedious process. (Dr. T. Maclagan, p. 32, and Lancet, Oct. 28, p. 601.)

Quinine, Iodide of Potassium, Salicin.—A pill of quinine two grains and extract of henbane three grains, every four or six hours, with three to five grains each of iodide of potassium and carbonate of ammonia in mixture. This medicine is, with slight variations, found, in Dr. Greenhow's experience, to be superior to any other. He has had but little satisfaction with salicin in doses of about twenty grains. Dr. Henry Thompson usually adopted a moderate alkaline treatment for rheumatism; and out of about twenty cases in which he had used salicin, had only specially good results in one or two; but the majority had been of subacute character. In

the case we saw, and in which salicin had seemed to relieve pain, the heart was affected at the time of admission. (British Medical Journal, Aug. 19, p. 237.)

Perchloride of Iron.—Dr. Russell Reynolds was one of the first to point out the treatment of this disease by perchloride of iron. Dr. Dyer, of Ringwood, reports several interesting cases which were rapidly benefited by giving this medicine in doses of twenty drops every four hours. Of course this dose can be varied. In rheumatic fever we have an *acid-generating* condition rather than a simple acid one, and for this the muriatic acid is highly beneficial, as seen in the acidifying forms of dyspepsia. (Dr. S. S. Dyer, p. 50.)

Salicylic Acid.—The main advantages claimed for salicylic acid, in addition to its powerful antiseptic effects, are its non-irritant quality, its non-volatility, and its freedom from odour. Among its lesser advantages may be classed its non-poisonous nature and the readiness with which it can be incorporated with fatty substances in the preparation of ointments. On account of its extreme antiseptic powers only a very small proportion of the acid is required, and even when a strong preparation is employed the irritation is so slight as to be hardly worth consideration. Carbolic acid is a powerful irritant, and even when used in a very dilute form it still gives rise to such a degree of irritation as to prevent epidermic formation. Carbolic acid then being a most unsuitable application for a sore or wound when cicatrising action is required, some other must be sought for. Sulphate of zinc in the form of red lotion, boracic acid, and chloral hydrate all answer fairly well, and in many cases leave nothing further to be desired; but I am firmly persuaded that salicylic acid is at once both the most generally useful and productive of more favourable results than all the others put together, for under its influence the granulations become small and pointed, the discharge lessened and non-irritant, and the formation of epithelium takes place with amazing rapidity. The successful issue in cases of lacerated wounds, or other open sores, does not depend on the employment of any one antiseptic throughout, but on the judicious selection of a certain substance at the proper period—at least such is my experience; and the practice I now almost invariably follow is to use an oily liniment of carbolic acid so long as marked sloughing goes on, and after the wound has become so far cleansed, a watery solution of salicylic acid is then applied. Though only sparingly soluble even in boiling water, still by adding a small proportion of borax, a lotion strong enough for any purpose can be readily obtained. The lotions I use contain

respectively 5 and 10 grains of salicylic acid and 3½ and 7 grains of biborate of soda to the ounce of water. No stronger watery solution can be required than the ten-grain one, and the presence of the borax is not in the slightest degree objectionable. The plan I generally adopt is to commence with the weaker solution, and if I find that it is not sufficiently stimulating, I gradually increase the quantity of the antiseptic, and *vice versa*. The effects of these solutions are unequalled, for the growth of the granulations proceeds at a simply marvellous rate, deep hollows becoming filled up in a few days, and simultaneously epithelial formation proceeding rapidly in such parts as are ready for that process taking place. Various forms of ointment may be compounded, as salicylic acid, unlike boracic acid, can be readily incorporated with fatty substances. The following is perhaps the most generally applicable of any:—Salicylic acid 3 ss.—3 j., white wax 3 j., paraffin 3 ij., almond oil 3 ij.; melt and rub up in a heated mortar. This ointment, which is merely a modification of Professor Lister's boracic ointment, should be spread on strips of muslin or fine linen, and is a thoroughly trustworthy antiseptic application. The other ointment is a simple admixture of the acid and simple ointment. Wagner states that in making it it is advisable to use alcohol as a solvent, as the direct mixture of the acid and lard does not give the same good results; but as I have long been in the habit of using it in its more simple form, and have obtained most excellent results, I have not thought it necessary to change my original formula. The proportion of the acid varies with the use to which the ointment is to be put; in the cases in which I have chiefly prescribed it—viz., circumscribed eczematous affections of the head and face, I have found half-a-drachm to a drachm to the ounce wonderfully efficacious. (Dr. J. C. Ogilvie Will, p. 33.)

Salicylic Acid is an antiseptic, disinfectant, deodoriser, and astringent. In powder, it is almost impossible to swallow it alone, as I believe, from the experience I have had in trying it, that the heat of the mouth causes carbolic and carbonic acids to be evolved. It can be administered in rice-paper, or in combination with starch, or it may be administered in the following formula, which I have found useful, and which does not hurt the mouth and throat to any extent compared to the powder. ℞. Acidi salicylici, potass. bicarb. āā gr. xv.; aquæ ʒj. S. Carbonic acid is evolved, and the potash combines with the acid to form salicylate of potash. Salicylic acid is non-poisonous, as much as ℈iv. having been administered in Germany. I myself have taken as much as ℈ii. without producing the slightest ill effect, except displaying its

specific action. (Mr. J. A. Erskine Stuart, Edinburgh Med. Journal, Nov., p. 390.)

M. A. Casson proposes the employment of citrate of ammonia as a means of facilitating the solution of salicylic acid. Half-a-drachm of salicylic acid dissolves readily in less than four ounces of water (120 grammes), if 37 or 45 grains of citrate of ammonia are added. The following is the formula for a solution: Salicylic acid, ʒ i; citrate of ammonia, ʒ ss; rum or brandy, ℥i; distilled water, ℥v. A tablespoonful of this solution will contain from 4 to 4½ grains of salicylic acid. The citrate of ammonia is easily prepared by saturating ammonia in a solution of citric acid. (p. 28.)

SEPTICÆMIA.—I draw no distinction between septicæmia and pyæmia, believing that if there is a distinction it a distinction without a difference. Both are caused by organic matter (septic germs) entering the general system. The experiments of Chauveau and Burdon Sanderson demonstrate that if a septic fluid capable of producing toxæmia when injected into the veins of a living animal be strained through a porcelain filter, the liquor so filtered may now be injected with impunity, whereas the solid residue remaining on the filter retains in full force all the septic properties of the original fluid matter. This residue is shown to entirely consist of bacteria. Now, bearing in mind the fact that ozone destroys organic matter, and remembering that it is organic matter which gives rise to the putrefactive changes of septicæmia, let us inquire how we can practically bring this agent to bear. I find that the air of Manchester is absolutely devoid of this natural antiseptic, but it fortunately happens that nothing is easier than to manufacture ozone, and this, too, quite on a grand scale. With a Rumkopf coil, such as this, and one of these generators of Tisley's, you could fill the largest ward in this hospital with ozone in a few hours. Now that I put the battery in action, so as to electrify the oxygen as it passes through the tube, you see the gas in its changed state coming off in large quantities, blackening this prepared paper, and changing this solution of starch and iodide of potassium into a deep and beautiful blue. Without venturing to affirm that every antiseptic acts simply as an oxidising agent, we may safely affirm that no antiseptic is so potent as nascent oxygen or ozone; hence it seems to me that when an epidemic of septicæmia has vitiated the air of our wards we should resort to this agent for purification. Pyæmia, septicæmia, and puerperal peritonitis (all varieties of one disease, which may be generically termed septicæmia) are associated with the de-

velopment of organic germs, "bacteria," which act either as the carriers of the poison or as the poison itself; that septicæmia may be, and is, carried in a hospital from one patient to another by surgeon or nurse; that all cases of septicæmia occurring in a hospital should be at once removed and effectually isolated from contact with the other cases; that as ozone destroys the vitality of bacteria, ozone should be employed to purify our wards when septicæmia has appeared in them; that this may be readily effected in a few hours by means of a small battery and Tisley's ozone generator. (Mr. S. Messenger Bradley, p. 1.)

TYPHOID FEVER.—*Belladonna.*—The stimulant action of belladonna on the heart is converted in the pyrexial state into a tonic and, and if not pushed too far, even a sedative influence on the heart and blood-vessels generally; in other words, that it is a tonic and sedative to the sympathetic nervous system generally. This I take to be the fundamental explanation of its effects in the febrile state. By this action the capillary circulation is accelerated, the contraction of the vessels promoted, and thus the arterial tension which attends congestion of the parenchymatous organs is relieved, and a load at once removed from the heart. Diminution of temperature is the direct consequence of these changes. As the result of the prolonged use of belladonna after the cessation of the pyrexial stage, I have noted an irritable debility of the heart as if it had been exhausted by over-stimulation, and the nervous system has also shown a participation in this effect. (Dr. J. Harley, p. 14.)

AFFECTIONS OF THE NERVOUS SYSTEM.

APOPLEXY.—Quite in the commencement of the attack, and particularly when the hemorrhage is not abundant, the temperature remains normal; but, after ten or fifteen minutes, the thermometer in the rectum or the arm-pit shows signs of falling. Respiration may still be quite regular, and the pulse may beat quietly at the rate of 70 or 76, yet you will see the mercury receding to 97 deg., 96 deg., and even 95 deg. Where this fall takes place rapidly, and reaches the lowest degree just mentioned, the prognosis is bad; while, if the fall is only slight, say one degree or one and a half, and is protracted in its production, the prognosis is generally favourable. Where there are severe convulsive attacks, lasting for many minutes, and where the head and eyes are persistently turned away from the paralysed side, you may conclude that the hemorrhage is progressing more or less rapidly and that the blood is irritating and undermining the

central ganglia, previously to its destroying their texture. (Dr. J. Althaus, p. 66.)

The cause of cerebral hemorrhage in by far the greater number of cases is the formation of minute aneurisms on the cerebral vessels. Your object must be to arrest the further effusion of blood from the ruptured coats of the miliary aneurisms, by causing the vessels to contract. Now, many styptics must be inapplicable for these cases, because the patient cannot swallow, and even if medicines were introduced into his stomach, it seems most doubtful whether they would be absorbed. Nor can the rectum be used for the purpose of affecting the circulation, as there is frequently paralysis of the sphincter ani, and inability of the bowel to retain its contents. The hypodermic mode of administering medicines seems, therefore, to recommend itself, particularly in these cases; and the remedy I think most appropriate for them is ergotine. There are two kinds of ergotine known to chemists, viz., Wiggers's and Bonjean's. The former is insoluble in water, ether, and dilute acids, but soluble in alcohol, strong acetic acid, and caustic potash; and, on account of these peculiarities, it is not suitable for subcutaneous injection. Bonjean's ergotine, on the other hand, is easily soluble in water, and it is this therefore which you should use. I am in the habit of injecting a grain of it every hour, or, where the symptoms are very urgent, even every half hour, into the subcutaneous cellular tissue. (Dr. J. Althaus, p. 71.)

CHOREA.—*Enemata of Chloral.*—MM. Goeltz and Auger record a case of chorea which was successfully treated by enemata of chloral after all other remedies had failed. Two injections daily of a drachm each of chloral were administered for every fifteen days, by which time the movements had completely ceased. (Edinburgh Medical Journal, Aug., p. 185.)

EXTREME PLUMBISM. — *Galvanic Baths.* — The patient, thirty years of age, had lost the use of his upper extremities and his voice, owing to lead poisoning. He was galvanised and faradised, and took iodide of potassium for four months, without any benefit. At last it was determined to try galvanic baths. He was placed in a warm bath 85°, and the water charged with 28 cells of the continuous current battery. At first the current was passed from the positive pole placed at the nape of the neck, to the negative at the feet. After ten minutes of this the negative pole was moved about along his arms, &c., and he was kept in the bath twenty minutes. Said he felt the galvanism a very great deal more in the water than when applied in the ordinary way. 17th. Has

had the bath every day since he commenced; can now swing the arms freely and flex them pretty well; he can also walk with but little help; says he feels much stronger and better; has a constant irritation all over him in the skin for ten or twelve hours after the bath; bowels, which were constipated before, are now quite regular; urine much increased in quantity; appetite very good; is certainly gaining flesh. Here was a man whose health was completely undermined by the slow poison of lead, having sustained an enormous loss of muscular fibre, and who was placed under the usual treatment, which was persevered in from the 22nd of June to the 4th of December, with but slight benefit. He was then placed under the galvanic-bath treatment, and from the first of these baths the patient began to have new sensations, showing the immediate action on his system. From this time he continued to improve, and not only so, but he seemed to undergo a perfect regeneration of muscular fibre. (Mr. S. J. Knott, p. 79.)

INFANTILE CONVULSIONS.—*Enemata of Chloral.*—M. Polaillon in two cases gave an enema of 3 grains of chloral in 5 drachms of water. Sleep and cessation of convulsions followed, and a repetition of the enema twenty-four hours later completed the cure. (Edin. Med. Journal, Aug., p. 185.)

NEURALGIA.—*Electricity* has recently become the most important remedy in the treatment of neuralgia, in consequence of the brilliant success that has attended its application in many different forms of the disease, and in no other disease are the results of electro-therapeutical treatment so certainly estab-established as in neuralgia. Of the two kinds of electricity now in constant use, the galvanic current (continuous current) is found to be the more active and applicable to a greater variety of forms of the disease than faradic electricity. Faradic electricity (the interrupted current) is chiefly useful in peripheric neuralgia, when the nerves can be reached by the current, and in cases where no remarkable anatomical change, as neuritis or the like, is present, and thus, especially in the so-called purely idiopathic, or "habitual," neuralgia. The *galvanic current* (continuous current) has at least the same action upon peripheric neuralgia, whilst, in addition, it is very effective in the central and deep-seated forms of the disease (spinal and cerebral neuralgias, and neuralgias of the roots of nerves). Moreover, by its "catalytic" effects—that is to say, by its influence on the vessels, upon exudations and the processes of nutrition—it exerts a wide influence on those neuralgias which are uninfluenced by the faradic current. There are two methods of applying *faradic electricity*

(interrupted current)—*a*. By conducting a strong current of the secondary spiral, for a few minutes, through the nerve, by means of moist electrodes, one of them being placed on the nerve trunk as near as possible to its central origin; this plan must, for the most part, be frequently repeated. *b*. By producing energetic irritation of the skin with an electric brush, or by means of an electric moxa, in the region of distribution of the nerve, at its point of emergence, and over the *points douloureux*. The application of *galvanic electricity* (continuous current) is especially intended to modify the nutritive processes taking place in the nerve, to produce the so-called catalytic effects, and to lower the irritability of the nerves. The results of its application, either according to the polar or the direction method, seem to be equally good. In the polar method the anode (positive electrode) is applied first upon the nerve trunk (when possible in the immediate vicinity of the proper focus of the disease), and then upon the *points douloureux*, and the cathode (negative electrode) upon some indifferent point. In the direction method, the descending direction of the current is used by preference, and the anode (positive electrode) is then to be placed upon the plexus, or upon the roots of the nerve, and the cathode (negative electrode) upon the nerve trunk and the painful points. As a rule, the duration of the sittings should be short, extending over from two to eight minutes, and repeated daily, or every other day. The strength of the current, must in general, be moderate. The effects are usually experienced at once, and continue for a variable period, from two or three to twenty-four hours, ultimately, after a variable number of sittings, becoming permanent. If, after a moderate number of sittings, as from six to ten, no appreciable benefit is experienced, the case must, in general, be regarded as one not adapted for the electrical plan of treatment. In the very first rank amongst specific remedies is to be placed *arsenic*, which acts not only as an anti-periodic remedy in neuralgias of malarial origin, but also as a proper nervine tonic. It is especially effective in cases where there is a general nervous diathesis and imperfect formation of blood. In such cases Fowler's solution may be given in doses of from three to ten drops three times a day, in gradually increasing doses, or the arsenious acid may be given dissolved in water, in doses of from one-eighth to one-half of a grain per diem, in divided doses. Recently arsenic has been injected hypodermically (Eulenberg), and there are certain advantages in this method of using the remedy. *Zinc*, in the form of oxide, or of valerianate, or of sulphate, if used, must be prescribed in large doses. *Phosphorus* is warmly

recommended, especially in anæmic and neurasthenic neuralgias. The preparations of *iron* are of undeniable value in the anæmic forms of neuralgia. *Quinine* has a very decided action on neuralgias, even where they are not dependent on malaria. *Strychnia* is highly praised, whether given internally or injected hypodermically, and it may be given combined with the solution of chloride of iron. *Iodide of potassium* proves serviceable in many cases of neuralgia, as in those of chronic rheumatic character, and in very obstinate idiopathic cases. *Bromide of potassium* is extremely valuable, especially in cases where it produces an hypnotic effect. (Prof. W. H. Erb, p. 57.)

TETANUS.—*Chloral.*—In the Lancet for 15th April, Dr. Leonard Cane records a case of tetanus which was successfully treated by 20 grain doses of chloral, frequently repeated. (Edinburgh Medical Journal, Aug. p. 185.)

TOOTHACHE.—*Carbolic Acid.*—In cases of toothache where there is extensive caries, and when the patient objects to extraction, carbolic acid is a valuable local application. The most eligible way of applying it, is equal parts of Calvert's carbolic acid (liquefied by heat) and collodion. In the majority of instances which have come under my observation it has given almost instant relief. (Mr. E. A. Piggott, Lancet, July 15, p. 105.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

CARBOLISED CATGUT LIGATURES.—About six months ago Mr. Holmes brought forward a case at the Clinical Society, and the question of the use of the carbolised catgut ligature was very fully discussed. In the tying of all vessels at the Cardiff Infirmary we have used nothing but this ligature for several years, and the few cases we have had of tying vessels in their continuity have done remarkably well. It is surprising to see how curtly our text-books speak of the catgut ligature. (Dr. Sheen, p. 184.)

CARBOLISED SILK LIGATURES.—Silk ligatures when drawn through melted wax and carbolic acid are equal to carbolised catgut in absence of irritating qualities, and superior in strength. A case in which this ligature was applied to both external iliacs for inguinal aneurism proves that prepared silk ligatures may be applied on the continuity of an artery, and neither cut it nor produce suppuration, for both of these ligatures still remain, I believe, around the iliac arteries where I placed them, the one thirteen months, the other six months ago. As to the exact state of these ligatures, the

best information I can give you is the following:—On the 15th of last January I assisted the late Dr. Dewar to tie the femoral artery with a silk ligature prepared as mine were. Unfortunately the patient, who was an old man and otherwise ill at the time of the operation, only lived for twenty-four hours. I examined the artery and ligature carefully after death, and found that the latter had ruptured the internal and part of the middle coats of the former, the rest of the arterial wall remaining sound. The parts of the coat which had been ruptured were turned in towards the centre of the tube, and glued with lymph and clot. The ligature was buried in lymph, and, on cross section, was seen to be already intruded into by the cellular elements. I have little doubt that its fibres would have soon been further separated and encapsuled by the lymph, and thus preserved from change. Such I believe to be the state of the ligatures in my case. They are still holding the arteries, but they are, by this time, so incorporated with living tissue that they may continue there indefinitely, without causing any disturbance or irritation. My experiments would seem to show that if suppuration is entirely prevented, the catgut ligature will hold for twenty-four hours, or perhaps even longer; but as no surgeon can be certain of securing that condition, especially in deep wounds and unhealthy patients, the propriety of employing catgut ligatures in such cases is rendered doubtful; whereas the successful case of ligature of both internal iliacs now before you goes far to prove the safety and the certainty of prepared silk ligatures in such cases, and the length of time which has elapsed since the operations greatly strengthens this conclusion. (Dr. Eben Watson, p. 180.)

HÆMOPTYSIS.—*Ergot.*—Dr. Greenhow has had excellent results from the internal administration of twenty to thirty drops of the fluid extract at suitable intervals; he had had no occasion to use the hypodermic injection. Turpentine internally, he found the best alternative treatment. (British Medical Journal, Aug. 19, p. 237.)

HEMORRHAGE AFTER TEETH EXTRACTION.—With regard to treatment the most reliable is plugging either by a thin strip of lint steeped in a styptic, and carried completely to the bottom of the alveolar cavity, and gradually doubled and redoubled upon itself until a dense and graduated plug is formed; or by pellets of cotton wool saturated with perchloride of iron, beginning with small ones, and gradually enlarging them till the alveolus is thoroughly and firmly filled, when a pad of lint or cork should be placed over the plug, the jaws closed, and a bandage passed over the head

and under the chin. The use of an impression tray either for upper or lower jaw would keep the compress in position and aid the pressure. In cases of hemorrhagic diathesis, especially where there is a tendency to extension of bleeding over the mucous membrane of mouth, I would suggest, after the part has been thoroughly cleansed from blood, that an impression tray filled with plaster of Paris, mixed with warm water to which a little salt has been added (as the plaster then sets more rapidly), be applied as if about to take an impression of the mouth, and kept in position for twenty-four hours. By this means we should have a firm, unyielding compress all over the jaw. (Mr. W. G. Ranger, p. 196.)

NÆVUS.—*Capillary Nævi, or Mother's Marks.*—These "port-wine stains," as they are often called, sometimes cover large portions of the face, and are very disfiguring. In a case of this kind the part was tattooed with carbolic acid, with the very best result. In about three weeks the discolouration completely disappeared leaving the cuticle of natural colour. (Mr. S. Messenger Bradley, p. 189.)

Large Veno-Cutaneous Nævus.—An infant, eight months old, had a large and prominent nævus situated above, and extending into the helix of the left ear. It measured two inches and-a-half by one and-a-half. I resolved to treat the case as Lister advises, by the injection of carbolic acid; but first, to prevent any risk of embolism, I transfixed the base of the tumour with two long hair-lip pins at right angles to each other, and strangled the entire mass with a ligature tied tightly beneath the pins. I then injected five minims of pure carbolic acid, dispensing it as evenly as possible in minim doses, here and there over the whole tumour. The ligature was cut, and the needles removed in ten minutes. Little if any change was apparent three days later, when I repeated the process. After a further lapse of four days, no improvement being perceptible, I ligatured the nævus by means of a Fergusson's knot, and admitted the child into the hospital; its cries, however, were so piteous and continuous, that the house surgeon was compelled to remove the ligature in about six hours, and I do not think that its introduction contributed in any material degree to the successful issue of the case. The following week I again resorted to the injection, and repeated it at intervals of four and five days; but it was not until three weeks had elapsed, and the injection had been employed half-a-dozen times, that any diminution was perceptible. At this period, however, a decrease became manifest, and this decrease steadily progressed, *although no further injection was used.* From week to week until now

(March 14th) the tumour is no longer at all raised above the level of the surrounding skin, and the integument has almost entirely regained its natural character and colour. (Mr. S. Messenger Bradley, p. 188.)

POPLITEAL ANEURISM.—*Use of Esmarch's Bandage.*—At the Royal Naval Hospital, Plymouth, a case of popliteal aneurism was cured in fifty minutes by the application of an Esmarch's bandage, and the cure remained complete. The aneurism ultimately ceased to give either trouble or inconvenience, and the remains of it could only be distinguished by comparison with the opposite limb. The aneurism was cured by the rapid coagulation or death of the blood consequent upon its complete stagnation in the sac. (Dr. W. Reid, p. 186.)

PURPURA.—*Hypodermic Injection of Ergot.*—In a case of purpura ten drops of Cooper's fluid extract of ergot were given, undiluted, on the first three occasions, and twenty drops on the fourth. The first two insertions were in the glutei muscles, the third and fourth in the back of the shoulders. Inject *very slowly*, and observe the greatest care in regard to cleanliness in the syringe, excluding the possibility of the entrance of extraneous matter and air, which together with the too hasty injection of the fluid, a fruitful source of trouble in hypodermic medications. The conclusion come to as to the result was, that there was "absolutely no new development of the hemorrhages after the first injection." In a second case ergot was given by the mouth with the result of the eruption being almost gone in two weeks, after the dose of ergot had been increased. (Dr. L. Duncan Bulkley, Practitioner, Nov., p. 321.)

TORSION OF ARTERIES.—In more than one of our metropolitan hospitals, and certainly in one of our largest provincial hospitals, torsion has almost, if not quite, displaced the ligature, and has proved a most successful substitute for it; yet it is not the custom to detach the twisted end of the artery if the vessel be of large size, though it is admitted that in the case of small arteries it is immaterial whether or not this is done. It is stated in Bryant's "Surgery" that "at Guy's Hospital up to 1874 we have had 200 consecutive cases of amputation of the thigh, leg, arm, and forearm in which all the arteries had been twisted (110 of them having been of the femoral artery), and no case of secondary hemorrhage;" and other statistics to prove the same point could be quoted from the Middlesex Hospital and elsewhere if there were need. So far from torsion short of actual detachment being useless, we would urge that it is advantageous to leave the twisted extremity undetached. The twisted end affords an additional

mechanical safeguard against the occurrence of hemorrhage. while it also acts as a support to the lacerated and recurved inner and middle coats, and to the coagulum which forms within them. It has been proved to demonstration that the twist in the external coat is a persistent condition, while it has also been satisfactorily established that the twisted portion of the artery does not die, that no sloughing ensues, but that adhesion between the parts of the artery, and between them and the surrounding structures subsequently occurs. In all this lies the superiority of torsion over the ligature. (Ed. of Med. Times and Gazette, p. 193.)

1. Torsion is applicable to arteries of all sizes, but is most applicable to large ones. 2. A single pair of forceps is all that is required to effect the torsion. 3. The artery ought to be seized obliquely, so that the whole width of the vessel is completely in the grip of the instrument. 4. The artery must be twisted till the end seized separates away altogether. 5. It is useless to roll back the internal tunics on the proximal side, or to limit beforehand the point at which the torsion should terminate. 6. Torsion can be effectively applied to atheromatous arteries and to inflamed arteries. 7. The torsion of arteries favours the immediate reunion of wounds. 8. Torsion is as effective as the ligature in preventing primary hemorrhage, and much better than the ligature in preventing secondary hemorrhage. (M. Tillaux, Practitioner, Aug., p. 143.

AFFECTIONS OF THE RESPIRATORY SYSTEM.

BRONCHITIS.—*Inhalations.*—In chronic bronchitis, one teaspoonful of turpentine to the pint of boiling water is an useful form; or ten drops of creasote in the same; in spasmodic dyspnœa, one teaspoonful of ether given in the same manner is very efficacious. (British Medical Journal, Aug. 19, p. 237.)

DIPHTHERIA.—It is very necessary that the air should be moistened by a regulated escape of steam from a suitably contrived kettle. Nothing can be better for the purpose required than Dr. Petty's kettle, which is thus described by Sir William Jenner:—"This is a tin kettle with a small aperture at the top, closed by a screw instead of a common lid. From the front of the kettle project two spouts of about three feet in length. One spout springs from the upper part of the kettle, and passes forward in a straight line; the other spout springs from near the bottom of the kettle, and passes obliquely upwards. The lower spout ends

in a spoon-like projection, just under the slightly curved-down open mouth of the upper spout. The steam passes out of the upper spout, and the condensed vapour drops into the little spoon, and is returned by the lower spout to the bottom of the kettle." A thermometer and a steaming-kettle are indispensable in the chamber of the diphtheritic patient. (Sir J. Rose Cormack, p. 107.)

EMPYEMA.—*Lister's Antiseptic Method.*—In this case thirty ounces of pus were removed by the aspirator. In a fortnight the side was as full as ever. Accordingly, the patient was put under chloroform, and I inserted a drainage-tube in the sixth interspace in the anterior axillary line, letting out about twenty-eight ounces of pus. The operation was performed strictly according to the antiseptic method, and the usual dressing was applied. For several days, the free discharge of pus necessitated the change of dressing morning and evening; but the amount of discharge rapidly decreased, and for the next week one dressing a day proved enough. After that, for the next sixteen days, the dressing was changed every other day only. As the discharge had now become very scanty, from this time to the removal of the drainage-tube on March 9th, the side was dressed once in every three or four days only. On the 17th, the wound had completely closed. The advantages of the antiseptic treatment are these:—1. A free discharge is allowed. 2. Decomposition and consequent absorption of the products of putrefaction are prevented. 3. The treatment is very much less disturbing and exhausting to the patient, both because the process itself is much simpler, and also because it is less frequently repeated. 4. There is no irritation of the pleura. 5. One, and perhaps the chief, cause of sudden death during the after treatment is avoided. (Dr. E. Markham Skerritt, p. 89.)

Incision of Chest versus *Paracentesis.*—In a case of empyema, five pints of pus were withdrawn from the pleural cavity by by means of an aspirator. The relief, however, was—as it almost always is—only temporary. Accordingly, I made an incision between two and three inches in length, between the ninth and tenth ribs, in a line with the inferior angle of the scapula down to the pleura, on opening which over six pints of inodorous pus escaped. A piece of lint was placed in the wound, and a large linseed-meal poultice applied over it, into which the pus drained, and which had to be frequently changed. The relief to all the urgent symptoms was at once apparent. From the day of opening the chest, the patient slowly, but surely, progressed towards recovery. The bed-sores disappeared, as also the aphthous condition of the

mouth. Flesh was gained, and it soon became difficult to satisfy the craving for food. The local treatment adopted was to wash out the cavity every other day with Condy's fluid; but, as its deodorising effect did not last long, tincture of iodine (one part to twenty parts of water) was soon substituted, from the time of using which not the slightest unpleasantness was perceptible either in the room or on dressing the wound, although a quantity of pus was continually discharging. (Dr. C. S. Ticehurst, p. 96.)

PHTHISIS.—*Hypophosphite of Lime.*—The hypophosphite of lime is a remedy of great value in phthisis, and provided the case is seen early, and the disease limited in extent, it seems almost curative. In a case of this nature, and in this stage, I ordered three grains of the hypophosphite of lime twice daily, and also to make careful thermometric observations, which were continued for two months. For the first two nights the temperature was 101° at night and 100° in the morning. For two weeks afterwards the thermometer was found to stand at 100·5° at night and 99° in the morning. From this time it gradually came down until it was 98·5° at night and 98° in the morning, and it has continued thus until the present time. With regard to the other symptoms, the sweating stopped the first night and did not recur. The cough became less and less, and in six weeks ceased entirely. (Dr. M. Charteris, p. 100.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

CALOMEL AS A PURGATIVE.—It cannot be doubted that calomel, either alone or in combination with jalap, colocynth, or scammony, constitutes one of the most certain and efficacious purgatives, clearing the entire portal system, producing a large flow of bile in the motions (though not manifestly acting as a strict cholagogue from the liver), and affording a measure of relief to the body unattainable by any other means. Undesirable results would follow if mercury was frequently given in such cases as I have enumerated; but I only allude to the practice of employing it at the outset, and then it should be given boldly in doses of from one to five grains over night, once for all. In adults a draught may be given on the following morning, containing any suitable saline aperient, such as sulphate of magnesia or Carlsbad salt. (Dr. Dyce Duckworth, p. 359.)

CANCER OF THE RECTUM.—*Colotomy.*—In comparing the operation of excision in cancer of the rectum with other means of treatment, Mr. Curling unhesitatingly gives the preference to colotomy:—"I am unwilling to discourage any attempt

to cure or relieve so dire a disease as cancer of the rectum by excision, but knowing the danger which must be incurred from hemorrhage in the operation, the misery likely to ensue from incontinency of fæces, and from contraction in the wound, if healing takes place, as well as the prospect of an early return of the disease, I cannot think that the chance even of a prolongation of life is worth acceptance on the terms offered by such an operation, and I hold that much more is to be gained with less risk to life by another proceeding, viz., lumbar colotomy, which is applicable also to cases in which excision would be impossible. (Mr. T. B. Curling, Edin. Med. Journal, Oct., p. 329.)

Excision of the Female Rectum for Cancer.—The female rectum, from a surgical point of view, is a totally different organ from the male rectum. It is different in size, and, what is more significant to us, it is very different in its relations and accessibility. A woman's rectum, with its ailments and its contents, can be reached at almost every aspect. I do not mean, merely, that a small hand can be introduced into it when it is healthy and in certain diseases, but that it can readily be got at from the outside in health and disease: in short, the female rectum having in front of it so capacious a canal as the vagina, is practically almost as superficial an organ as if it were actually under the skin, like the mammary gland. The surgical bearing of the distinction is this, that objections to the excision of the rectum should not be of equal force in the two sexes. They should have much influence in males and scarcely any in females. On the continent, cases have been recorded of the bold excision of the rectum proper, and even of adjacent parts (suggesting, indeed, the idea of a general scooping out of the pelvis), regardless of sex. In this country, there is a strong disinclination to excision of the rectum; a disinclination with which I have much sympathy, and should have more, if it were not also an objection which pays no regard to sex. No records of alleged success would induce me to remove a cancerous male rectum, with portions of the urethra and prostate gland, allowing, if the patient survive for a time, fæces and urine to drop into one common chasm, only to drop out of it again. But are we quite right in refusing to remove an isolable cancer of the lower part of the female rectum (even though it began in the rectum) when it is distinctly below the peritoneal level, when the back wall of the vagina may be safely removed with it if it be needful; and when, above all, the urinary pathway may be left untouched? In a previous lecture on destruction of the rectum, you saw how a woman may live in moderate comfort without that organ. (Prof. Furneaux Jordan, p. 197.)

CHLORAL SUPPOSITORIES.—The following is Mr. H. Mayet's formula:—℞. Ol. theobromæ, gr. xxv; cetacei, pulv. chloral, āā gr. xlv. For one suppository. Chloral acts almost as energetically when introduced into the rectum as when given by the mouth. (Edinburgh Med. Journal, Aug., p. 185.)

CLEFT PALATE.—*Application of Strong Acid.*—Some cases of cleft palate can be cured simply by the application of strong nitric acid. I first produce a raw surface by carefully applying with a stick—*not a glass rod*—the acid. nitric. of sp. gr. 1·500, and in a few days afterwards I use in the same way the acid. nitric. sp. gr. 1·420 (P. B.) about once or twice a week to the part, but especially to the fork of the cleft. I have been induced to try this method from observing the singular success that follows the application of nitric acid in cases of cleft palate in which, after operation, the wound has partially opened. I have had recently, at St. Thomas's Hospital, two such cases, which, but for this method of treatment persistently employed, would have required a second operation. (Mr. F. Mason, p. 206.)

DYSENTERY.—*Chloral.*—Dr. David Punice recommends as an abortive of dysentery chloral hydrate in a dose large enough to produce sleep (30 grains), in conjunction with one or two ounces of sulphate of magnesia. Its effect may be aided by subcutaneous injection of morphia. (Edinburgh Medical Journal, Aug. p. 184.)

HERNIA.—*Inguinal Hernia.*—A case is related in which the hernial tumour felt very tense, giving above on percussion a slight resonant sound, and to the hand the feeling of a collection of fluid tightly compressed. Not being allowed to operate, and taking into consideration the character of the strangulated hernia, I decided on puncturing it. I introduced into the hernia the finest trocar of the aspirator, and with this instrument withdrew about an ounce of slightly turbid amber-yellow serum and a large quantity of gases. On withdrawing the canula, the hernia slipped back into the abdomen with the greatest ease. (Dr. H. Blanc, p. 205.)

Strangulated Hernia.—Inflating the Bowels.—In a case of strangulated hernia, in which reduction could not be effected, after raising the patient's hips on two or three hard pillows, and leaving the shoulders low, the taxis was again tried unsuccessfully. Mr. Sculthorpe now applied the ether-spray, which quickly blanched the surface and emptied the part of blood. I now made trial of the taxis, and, after some time, a small portion of the sac's contents returned, but the greater part was quite immovable. The bellows' point was then well

oiled and introduced *per anum*, and the application of the spray and taxis was renewed. The bellows (not being double-action) required to be withdrawn and filled again. On the fourth bellowsful being pumped slowly in the bowels were much distended, and, by careful pressure and manipulation, the hernia was reduced. The inflation of course acted by a sort of internal traction. The idea is not new, as it is I believe often used in France. (Dr. J. Holmes Joy, p. 203.)

HYPODERMIC ALIMENTATION.—In a case of chronic gastric ulcer in which no food could be borne by the stomach, and rectal injections were no longer retained, the life of the patient was maintained by hypodermic injections of milk, or beef extract, or cod-liver oil. The patient received sixty-eight hypodermic injections in different parts of the body, receiving in one day as much as four ounces of cod-liver oil. Two small abscesses formed, both from milk. The oil caused no pain, but the precaution was taken to raise it almost to the temperature of the body. In another case olive oil was used, and the patient, a lunatic, was supported by hypodermic injections for twenty days without any other aliment whatever; he made a good recovery. Hypodermic injections of liquefied fats, saccharine solutions, and yolk of egg, have also been used. Stricker and Oser have even tried injections of peptone. (Dr. G. F. Duffey, p. 115.)

INTERNAL PILES.—In the treatment of internal piles, considerable difference of opinion exists, as to which operation—the cautery or the ligature—is the best on the score of freedom from suffering, safety, and speedy recovery without confinement. As respects after-pain, there is little to choose, if care be taken to incise freely before the ligature is applied, and both operations are equally free from danger. The advocates of the cautery have, it is true, magnified the risks of the ligature. But, after a lengthened experience, I can state that, with one exception, no fatal case of operation by ligature has occurred either in my public or private practice. In 1868, a man aged 52, upon whom I had operated in the London Hospital for internal piles, and afterwards for fistula, was seized with pyæmia, followed by numerous abscesses, and after a protracted illness of five months, died. Erysipelas and pyæmia have also followed, though very rarely, the operation by cautery. Some amount of danger must be incurred in every kind of operation, serious results sometimes arising from the slightest causes; and the removal of piles cannot be expected to be exempt from risks which may attend a trifling puncture of the finger. An unfortunate result after an operation for piles, in persons free from organic disease, is, how-

ever, entirely exceptional, and, with common precautions; it may be regarded as safe as any operation in surgery. I continue to give the preference to the ligature as more convenient to the surgeon and less alarming to the patient. The operation by cautery is more tedious than by ligature, a matter of little moment when the patient is insensible, and special care is necessary in using the cautery to guard against after-hemorrhage. (Mr. T. B. Curling, Edinburgh Medical Journal, Oct. p. 328.)

INTESTINAL OBSTRUCTION.—*Opium.*—More harm than good often is done in these cases by too much interference on the part of the medical attendant. Of course, there are many cases of intestinal obstruction which demand prompt interference, in order to save the life of the sufferer; but many of such cases require operations, such as gastrotomy, from the mere fact that the previous treatment has been injurious, or, in other words, because the medical attendant has "done too much," instead of allowing Nature, assisted by opium, to overcome the difficulty. Too much interference in these cases is worse than if the patient had been left entirely to the care of Nature. It must be admitted that opium, given in full doses and often repeated, is the only remedy. A case of intestinal obstruction with great pain, in a man 40 years of age, is related, in which one grain of calomel and half a grain of opium were administered every hour. For four days previously it was elicited the patient had been taking purgatives. The abdomen soon became distended, and the next day, the symptoms remaining unaltered, one grain of opium every two hours was ordered. The next day he was worse, and the pills were ordered to be taken every hour. Vomiting of stercoraceous matter set in. On being visited the next day the patient felt something give way, and on the administration of an enema some scybala came away; the patient had an offensive stool, and recovery was soon established. (Dr. H. J. Hardwicke, p. 116.)

FRACTURES AND DISEASES OF BONES, JOINTS, &c.

ANTISEPTIC TREATMENT.—*Boracic Acid as an Ordinary Dressing for Wounds.*—Lister's antiseptic method of treating wounds is too tedious for the ordinary run of practice, and consequently is but rarely indeed resorted to. Boracic acid is an excellent substitute. The preparations of boracic acid have now been rather extensively tried by me for some months, and in all the cases in which they have been used the results have been good, and decidedly better than under the ordinary methods of dressing. The most convenient forms for use are

the boracic (boric) lint and cotton wool, a concentrated watery solution of the acid, and boracic ointment. Boracic lint is prepared by soaking lint in a saturated *boiling* solution of the acid. On drying the lint a copious deposit of fine flaky crystals takes place between its fibres. Cotton wool may be similarly served, and when dried and carefully picked out forms a very useful dressing. The concentrated solution is made by dissolving the acid in boiling water to saturation. The ointment is made by rubbing down one drachm of the acid with one ounce of simple ointment, or benzoated lard. Boracic acid, unlike most antiseptic agents, is bland and unirritating; and, whilst its non-volatility renders it less useful in some cases than carbolic acid, its great superiority to this and to chloride of zinc resides in its unirritating nature. The boracic lint is best used as a dry dressing, and for recent wounds where simplicity is desired it has no equal. A pad of lint applied immediately over the wound, and kept in place by pieces of strapping, is all that is required, and union by first intention is a common result. To sum up its advantages:—1, It is an *antiseptic which does not irritate and inflame*, and so allows the natural processes of healing to go on without much interruption. 2, It is exceedingly *simple* in its application, and can be used apart from all the details required by a thoroughly antiseptic method. 3, It can be used in the shape of the lint, lotion, cotton-wool, &c., in combination with most other methods of treatment. 4, Its *cost is trifling;* and though this is of secondary importance, it is a feature of the treatment which will recommend its employment in workhouse infirmaries and in dispensary and parish practice. (Dr. Leonard Cane, p. 159.)

Watery Solution of Sulphurous Acid as an Antiseptic in Country Practice.—Sulphurous acid is very readily prepared by burning a little sulphur under a vessel, inverted on a shallow dish filled with water. The water readily dissolves the product of combustion. In the proportion of one in twelve of water, I find that it at once alleviates pain, minimizes suppuration, is easily applied, and facilitates dressing the wound, while it costs almost nothing. When the fingers are the parts injured, I have a large teacup filled with the wash put by the patient's side, and into this the injured part, covered with the thinnest rag to be had, is dipped as often as desired. Should the injured part be the hand or any other part of the body, it is supported on a pillow covered with gutta-percha tissue or oilskin, and the wash is applied by means of a little tow, which is allowed to remain in the cup. (Mr. J. Balfour, p. 164.)

CICATRICES ON THE NECK.—*Obliteration.*—Depressed cicatrices resulting either from chronic glandular abscesses, or from disease of bone are so unsightly that various operations have been devised for their obliteration. The one now described is simple and most successful. The operation consists, 1, In subcutaneously dividing all the deep adhesions of the cicatrix by a tenotomy knife, introduced a little beyond the margin of the cicatrix, and carried down to its base; 2, In carefully and thoroughly everting the depressed cicatrix—turning it, as it were, inside out, so that the cicatricial tissue remains prominently raised; 3, In passing two hare-lip pins, or finer needles, through the base, at right angles to each other, so as to maintain the cicatrix in its everted and raised form for three days. 4, In removing the needles on the third day, and allowing the cicatricial tissue—now somewhat swollen, succulent and infiltrated—gradually to fall down to the proper level of the surrounding skin. The cicatricial tissue remains permanently raised, and of an opaque white colour.—(Mr. W. Adams, p. 166.)

DEPRESSED FRACTURE OF THE SKULL.—A century ago, operative interference was the rule in all fractures of the skull. It was Quesnay, himself an advocate of the practice of interference, who gave force to the opinions of dissentients, by the very title of one of those masterpieces of clinical study embodied in the memoirs of the old Academy of Surgery. It fell to the lot of another of the academicians to substitute for traditional empiricism rules of practice as prudent and safe in their application, as their conception was enlightened and their demonstration closely and carefully reasoned. With few reservations, Desault was opposed to the use of the trephine in fractures of the skull. It was otherwise with his great rival on this side of the Channel, Percival Pott. The elevator and trephine were his favourite instruments, and so great was his ascendancy in the surgical world, so much more fascinating for the multitude, then as now, were boldness and complication than prudence and simplicity, that his heroic action had many imitators; foremost amongst whom was his most illustrious pupil John Hunter, who went so far as to advocate the trepan in some doubtful cases, "as the operation can do no harm." Desault's conservatism told directly on the civil practice, not merely of his own countrymen, but of British surgeons. John Bell, with his true surgical instinct, with his impetuous energy, and with the furbished eloquence of his ripe culture, threw in his lot against the trepan. "After the expiration of my apprenticeship at these hospitals," Astley Cooper has placed on record, "I went over to Paris, to see the practice of Desault at the

Hôtel de Dieu; and there I found that scarcely ever under any circumstances did he trephine; and he was more successful than the English surgeons." Abernethy and Lawrence, too, were in this matter disciples of Desault, and on the same side must be mentioned one of the most enterprising surgeons of the century—a master who combined in a very rare degree fearlessness and judgment, power of brain, and skill of hands—I allude to Robert Liston. In his *Practical Surgery* he thus writes: "When fracture of the skull is complicated with wound of the scalp, the surgeon will not in general mend matters much by trephining, as has been advised, merely because there is a wound; if the depression is pretty extensive, and unless he has a better reason to give for the proceeding than the mere circumstance of the fracture being compound, as it is called, he will often thus add as much to the injury and to the risk which the patient is subjected to by it, as he would by dividing the scalp in simple fractures." In compound depressed fractures of the skull without brain-symptoms, the proper course of practice is not to trephine. (Prof. Sampson Gamgee, p. 149.)

DRAINAGE OF WOUNDS.—*Carbolised Catgut.*—The ordinary india-rubber drainage tube has many disadvantages. Why not make the entire drain of catgut instead of gutta-percha? If efficient, its advantages in being absorbable are apparent. This might be done in two ways: either by bringing the catgut ligatures out at the corners of the wound instead of cutting them short; or by passing a skein of catgut through the cavity of the wound before stitching it up. In a large wound, as far as I am at present able to judge, eight to sixteen threads should be sufficient in each skein; the number of the skeins depending on the shape and size of the wound. In cases in which very profuse discharge is expected, either in a specially large wound or after a tedious operation, in which the wounded surface is necessarily exposed for a considerable time to the irritation of the carbolic spray, it will be better to increase the number of separate skeins, stitching them to different parts of the wounded surfaces in order to keep them in position, than to depend on one or two thick skeins. I am led to form this opinion from the result in the case of excision of the knee. If it is ever necessary to use a skein of more than sixteen threads, one thread of catgut prepared in chromic acid should be added to act as a drain, if required, during the absorption and the molecular disintegration of the drain. Chromic acid gut should also be used to stitch the drain in position when such a procedure is necessary. As regards the thickness of the gut, I have used three thicknesses. The finer the gut the more numerous and the

smaller will be the capillary tubes between the threads. The fineness of the gut will not interfere with the capillary action through the threads. For these reasons, I am of opinion that the finest gut should be used; by its use the better will be the drain for any given thickness of skein. It may be a question of how much of the action is due to capillarity through and between the threads, and how much to the drain acting as a lead to the discharges. Capillarity has, I believe, the chief place. I have hitherto used the gut prepared in the usual way by soaking in carbolic oil. Simple soaking of the drain in carbolic lotion for a quarter of an hour before using will be sufficient in cases in which prepared gut is not at hand. (Mr. J. Chiene, p. 170.)

FRACTURES OF THE SHAFT OF THE FEMUR.—A model splint for fractures of the shaft of the femur must be one in which the muscles attached to the bone are in a state of relaxation; at the same time it must be some apparatus which allows of a continuous pull upon the limb, which can be increased according to necessity. These requirements are fully carried out by a splint devised by Dr. Nathan Smith. It is thus described by Hamilton: "It is simply a frame composed of stout wire and covered with cloth, which being suspended above the limb allows the limb to be suspended in turn to it by rollers, the rollers passing around both limb and splint from the foot to the groin. Wire of the size of No. 10 bougie is usually employed. The length of the splint should be sufficient to extend from above the anterior superior spinous process of the ilium to a point beyond the toes, the lateral bars being separated about three inches at the top and one quarter of an inch less at the lower extremity. In the case of a broken thigh, the upper part to which the cord for suspension is to be fastened, ought to be nearly over the seat of fracture, and the lower part should be placed a little above the middle of the leg." The method of suspension as shown by Hamilton differs a little from that I have been in the habit of using, and which I have taken from the plan adopted by Mr. Johnson Smith, Resident Surgeon at the Seaman's Hospital, at Greenwich. It does not, however, differ materially from the plan originally proposed, and consists of an upright fixed at the end of the bed, to which the limb is slung obliquely by means of a cord and pulleys. A modification of Nathan Smith's splint has been proposed by Hodgen, which seems to me better than the original (see woodcut, p. 139). Instead of fixing the splint on the anterior aspect of the leg, a cradle is made of it by attaching transverse bands of calico or bandage, and the limb is laid upon these bands, a stirrup having first been attached to the leg and foot, which

is afterwards fastened to the foot piece of the wire cradle. The cords for fixing the leg to the upright are attached to the cradle, which in its turn makes traction on the leg by means of the stirrup. (Mr. T. Cooper Forster, p. 136.)

FRACTURE OF THE PATELLA.—*Transverse.*—In a case of transverse fracture of the patella, after an interval of two days to allow the swelling to subside a little, the limb was put up in the following manner. The leg was placed on an inclined splint, extending from the heel to near the gluteal fold; the lower fragment was then firmly fixed in position and steadied by a strap of plaster passing right round the leg; a semilunar splint of Hyde's poroplastic material was now carefully modelled to the thigh, just above the margin of the upper fragment, and this held in position by two stout pieces of strapping, the whole being surrounded by a few turns of a convergent spica bandage. After allowing the splint to "set," I now took two steel hooks (about the size of those used by Malgaigne) and fixed them firmly into the splint, one on each side of the patella, the hooks being connected with a steel chain about three feet long; this was attached to the ordinary pulley-extension apparatus with a weight of nearly 4lbs. On allowing this to act, the upper fragment was at once felt to be drawn closely down, while the lower remained in position, and after twenty-four hours the approximation had so gone on that only with difficulty could the line of separation be felt. (Dr. W. T. Grant, p. 142.)

Compound Fractures of the Patella.—Forcible approximation of the fragments should not be attempted for the first few days. Taking all circumstances into consideration, there is, I believe, sufficient reason for doubting the truth of the dictum of surgical authorities that immediate amputation is the only proper way of treating compound fractures of the patella. Such a summary means of dealing with the injury seems rather barbarous in the present condition of medical science. At least in country practice, and in well-ventilated, healthy institutions, such as modern asylums, where "hospitalism" is neither a danger nor a bugbear, it would be monstrous malpraxis not to give the sufferer the chance of escaping with a serviceable, even although a stiff limb. And perhaps the dangers attending the lesion may prove, with antiseptics and judicious constitutional treatment, to be less than those concurrent with and subsequent to amputations. Professor Lister's success with operations involving joints, and Volkmann's with two cases of compound fracture of the patella, seem to be opening the way for a rational, conservative, and successful mode of treating the form of injury discussed. (Dr. J. M'Diarmid, p. 148.)

INCISIONS INTO JOINTS.—Professor Lister has found in his operations opening into joints, that a large incision is always a safeguard, by allowing free exit to synovia and pus. (Dr. J. M'Diarmid, p. 148.)

INFLAMMATION. —*Action of Morphia Given Hypodermically in Arresting.*—Ludwig and Lovén have discovered that irritation of a sensory nerve leads to the suspension of the action of the vaso-motor centre "in the part supplied by the nerve, and in those which immediately adjoin it, so that their vessels become dilated, while, at the same time, contraction of the vessels in other parts of the body is produced. The blood-pressure is thus increased generally, and produces in the locally dilated vessels a very rapid stream of blood." But morphia prevents this reflex action from an irritated sensory nerve, and is antagonistic to pain by acting "not only, in all probability, upon the encephalic centres, but by its effects upon each nerve-fibril along which the pain-producing impression travels, and upon every nerve-cell through which the impression passes." We may have thus an explanation of the fact discovered by Brunton, that opium limits to a marked extent the vascular congestion in a part where inflammation is being artificially produced. (Dr. J. M'Diarmid, p. 147.)

SEVERE SPRAINS.—Severe sprains are often serious fractures, though no bone be broken, or only a bit may be chipped off; the ligaments and fasciæ are ruptured, blood being extravasated into the joints, into the sheaths of tendons, and for some distance not infrequently between the layers of muscles. The swelling is great, the pain intense. The orthodox treatment by leeches and fomentations is valueless compared with circular compression and perfect immobilisation. (Prof. S. Gamgee, p. 175.)

AFFECTIONS OF THE URINARY SYSTEM.

LITHOLYSIS.—A new mode of curing stone is proposed, which may do away with operations for removal or crushing. The method proposed is to encase the calculus, while in the bladder, in a thin pouch of india-rubber, highly vulcanized, introduced by a suitable contrivance; and with the interior of this pouch containing the stone, free communication is had through the urethra by means of two small rubber-tubes, through one of which the operator can at will inject any stated quantity or kind of solvent he may require for the solution of any particular formation he may attempt to dissolve, the remaining tube being for the exit of the disin-

tegrated stone in solution.—(Dr. G. C. Duncan, Edin. Med. Jour., Oct., p. 322.)

PERINEAL SECTION, AS PERFORMED AT LEEDS.—The great advantage of this mode of operation is the certainty of the operator finding the way through the stricture into the bladder. He can hardly fail to succeed. The patient is placed in lithotomy position, with the pelvis a little elevated, so as to permit the light to fall well upon it, and into the wound to be made. The staff is to be introduced with the groove looking towards the surface, and brought gently into contact with the stricture. It should not be pressed much against the stricture, for fear of tearing the tissues of the urethra, and causing it to leave the canal, which would mar the whole after-proceedings, which depend upon the urethra being opened *a quarter of an inch in front of the stricture*. Whilst an assistant holds the staff in this position, an incision is made into the perineum, extending from opposite the point of reflection of the superficial perineal fascia to the outer edge of the sphincter ani. The tissues of the perineum are to be steadily divided until the urethra is reached. This is now to be opened *in the groove* of the staff, *not upon its point*, so as certainly to secure a quarter of an inch of healthy tube immediately in front of the stricture. As soon as the urethra is opened, and the groove in the staff fully exposed, the edges of the healthy urethra are to be seized on each side by the straight-bladed nibbed forceps, and held apart. The staff is then to be gently withdrawn, until the button-point appears in the wound. It is then to be turned round, so that the groove may look to the pubes, and the button may be hooked into the upper angle of the opened urethra, which is then held stretched open at three points (see woodcut, p. 209), and the operator looks into it immediately in front of the stricture. Whilst thus held open, the probe-pointed director is inserted into the urethra; and the operator, if he cannot see the opening of the stricture, which is often possible, generally succeeds in very quickly finding it, and passes the point onwards *through* the stricture towards the bladder. The stricture is sometimes hidden amongst a crop of granulations or warty growths, in the midst of which the probe-point easily finds the true passage. This director having been passed on into the bladder (its entrance into which is clearly demonstrated by the freedom of its movements), its groove is turned *downwards*, the whole length of the stricture is carefully and deliberately divided on its under surface, and the passage is thus cleared. The director is still held in the same position, and the straight probe-pointed bistoury is run along the groove, to insure complete division of all bands or other obstructions. (Mr. C. G. Wheelhouse, p. 207.)

PHYMOSIS. — Instead of cutting, or dilating from before backwards, Dr. Griffith tried as follows: — Making the patient stand in front of me, I grasped the penis with the fingers of both hands, and partly by retracting the foreskin, partly by projecting forwards the glans penis, I commenced this wedge-like dilatation, and soon had the satisfaction of seeing an area of surface around the mouth of the urethra. This procedure I repeated every other day, and, in a fortnight, the phymosis was quite cured, so as not to be likely to return. (Dr. G. de Gorrequer Griffith, p. 223.)

RESIN OF COPAIBA AS A DIURETIC. — The resin of copaiba is chemically an acid, and constitutes about 50 per cent. of the balsam. It is obtained sufficiently pure by distilling the balsam. In Guy's Hospital Dispensary, the resin is softened with about one-fourth of its bulk of rectified spirit, and thus converted into a viscid mass. Three ounces of this are rubbed down with four ounces of compound tragacanth powder, and mixed with four pints of water; one ounce of this mixture contains twelve or thirteen grains of the resin, and is given three times daily. The mixture forms a thick, whitish-green, opaque fluid, which deposits very slowly; being almost tasteless it is only unpleasant from the viscidity of the mucilage, and it is probably to this that the nausea, which not a few patients experience, especially after prolonged use of the medicine, must be ascribed. As a result of its administration in favourable cases the quantity of urine is quickly increased at the same time that its specific gravity is much lowered. A group of cases of cardiac dropsy treated by the resin afforded opportunities to compare its effects with those of digitalis. Often, indeed, they were given in combination, and in one case where this was the only medicine administered, the diuretic effect cannot with certainty be ascribed to either. In most cases, however, digitalis was given at some period, either alone or in combination with squill, nitrous ether, &c., and the advantage derivable from the addition of copaiba resin was very obvious. (Dr. F. Taylor, p. 126.)

SCARLATINAL ALBUMINURIA.—*Acute.*—In a number of cases which lately occured during an epidemic of scarlet fever, directly any albumen was detected in the urine, the patient was ordered the perchloride of iron, and was allowed no solid food except a little bread and milk, and as much water as he liked to drink; this treatment, together with keeping the skin gently acting, sufficed in the majority of cases, but in a certain number the urine was almost suppressed, and in some there were uræmic symptoms. Whenever either of these contingencies occurred I forbade all food for twelve hours,

the child to have nothing but water and a drink made of acid tartrate of potash (ʒj. ad. Oj.) in sweetened water with a little lemon-juice. If at the end of this time the kidneys were beginning to act I allowed a little milk, but not more than a pint in the twenty-four hours; if, however, the uræmia continued with little or no urinary secretion, I persevered with the water and bitartrate of potash, and in severe cases nothing else has been given for thirty-six hours. Dry cupping, mustard poultices over the loins, and a purgative were the only additional remedies employed. The explanation of the good effects of abstention from solid food, and especially meat, during the course of acute desquamative nephritis, is that if a patient is entirely deprived of nitrogenous food the work of the kidneys is lessened and the urine is rendered less irritating, and the mild diuretic action of the bitartrate of potash seems to be useful. The treatment of acute nephritis may be thus summed up:—1, Milk and water with arrowroot, no solid food; 2, Mild diuretics, such as the citrate or bitartrate of potash with a free supply of water; 3, The skin kept just moist; 4, A daily evacuation of the bowels. (Dr. F. de Havilland Hall, p. 121.)

STONE IN THE BLADDER.—*Detection of.*—What is the reason that a stone escapes discovery sometimes, even when sought for by a skilful hand? It is simply *because only a part of the bladder was examined*, so that it may be said that the stone is missed simply because the place where it is lying is not searched. It may be laid down that the shorter the beak of the instrument the greater the range and freedom of movement that will be permitted to it. The burly captain of a small yacht may be scarcely able to move about in the contracted cabin, whilst his little son will run about with ease. Let me apply this to the case of sounding. A large beaked sound may, through its great size, fail to detect a stone which could at once be discovered by a small beaked one. Mr. Coulson has a *lex non scripta* to the effect—"Behind an enlarged prostate suspect a stone." The experience of every surgeon would, I think, go to prove that most adults who have suffered from stone have also had enlarged prostates. When a small stone is lying quietly behind an enlarged gland it can readily be imagined how easy it is to miss it, especially with the sounds usually employed in this country, and hence it is always well to raise the patient's buttocks on a good stiff bolster, so as to make the fundus the lowest portion and force a stone to roll into it from the neck. The introduction of the left forefinger into the rectum to tilt up the bladder, the depression of the hypogastric region with the left hand, and the withdrawal of the urine through the sound, are

valuable and indispensable aids when searching for stone. (Mr. W. F. Teevan, p. 217.)

STRICTURE OF THE URETHRA.—*Improved Method of Performing the* "BOUTONNIERE OPERATION."—The patient, having had the rectum emptied and the perineum shaved, is to be put into the lithotomy position, and there secured with Pritchard's anklets and wristlets. A straight staff with a groove in it is now to be passed down to the face of the stricture. I know of none better than Mr. Wheelhouse's, in which the groove stops short half an inch from the end of the staff, which is tipped with a button, so that, after it has served as a guide for the surgeon to open the urethra, it can be turned round to hook up the apex of the wound with its button. The urethra is "to be opened *in the groove of the staff, not* upon its point" (Wheelhouse). There is a great advantage gained in the opening just above the stricture, rather than on a level with it; for the *cul de sac* containing the mouth of the stricture is preserved, and not slit up as it would be were the incision made at the point of the stricture. The edges of the wound are to be kept apart with sharp-pointed hooks, or two pairs of artery-forceps with nibbed points, as used by Mr. Wheelhouse; or two loops of thread may be passed through the edges, as introduced by the late Mr. Avery, and highly extolled by Dr. Gouley of New York. I have always used hooks, and found them answer every purpose. Now comes the most important step but one of the operation—searching for and finding the entrance into the stricture, and passing the instrument through it. English surgeons use metal probes, but I prefer the bougies as employed by Dr. Gouley, depicted in the woodcut (p. 215) at A C. A B is a very fine whalebone bougie, not much bigger than a horse-hair, and having each end tipped with an olive. It is an exquisitely made bougie, and was sent to me from Augusta, Georgia, by Dr. Coleman. The bougies for this operation must for the present be procured from France or America, as the English ones which I have seen are not sufficiently fine and smooth for the purpose, and all lack properly made olives at their ends. Having taken the bougie represented, I impart to one extremity a beak (as shewn at B), and with it I search for the entrance into the stricture. If I fail, I try with the other end of the bougie; and, if I do not succeed, I take one of Leroy d'Etiolles' "bougies tortillées" C. I may say that I have always managed to pass one or other of these bougies through the stricture into the bladder. It sometimes happens that there are several false passages or fistulæ, Each of the openiugs ought to be filled with a bougie, which is to be left there, and another and another passed till at last

one vanishes, apparently, into the bladder. This plan was introduced by Auguste Mercier, and is adopted by Gouley, and is a practical exposition of the method of arriving at a result by "the process of exclusion." I now come to the very pith and kernel of the operation. I think I have passed the bougie into the bladder, and I ask myself the all-important question, Whither has it gone? Before commencing to divide the stricture, I proceed to prove the position of the bougie, and to demonstrate conclusively whether it be in the bladder or not by sliding over and along the bougie a fine silver tube which is open at both ends, having a slit for the tenotome to run in, and is fitted with the vesical half of the elastic catheter; so that, when the tube is entering the bladder, the silver tube carrying the vesical half of the elastic catheter, is seen gliding over and along the bougie, which is now to be withdrawn, when urine will flow out of the metal tube if it be really in the bladder. If urine come out, the stricture is to be divided by sliding a probe-pointed tenotome along the slit in the tube, which is to be held in such a manner that the slit, which serves as a groove, shall look upwards. The deep part of the urethra is thus divided subcutaneously without enlarging the original wound. The vesical half of the elastic catheter is now to be gently pushed along the tube till it is fairly in the bladder. If its progress be arrested at any point, the tenotome must be reintroduced, and any opposing tissue divided. The vesical half of the catheter having been passed into the bladder, the metal tube is withdrawn, and the end of the urethral half of the elastic catheter is to be screwed into its fellow half, so as to make one continuous catheter. The next thing to be done is to pass the olive end upwards from the apex of the wound till it emerges at the meatus externus. This is usually easy to do; but if there be any trouble in doing it, an assistant can pass a large olivary catheter down the penis till the point of the instrument appears in the wound. The surgeon now catches hold of the point, and, having cut off three inches of the protruded catheter, he inserts into its cavity the end of the elastic catheter. The assistant, still holding the catheter he passed downwards, now draws it upwards, and thus brings up with it the other catheter, which was inserted into it by the surgeon. The catheters are now unlinked, and the one in the bladder can be retained or not as the operator may fancy. I look upon the retention of a catheter as a relic of a surgical age now past; for Dr. Gouley has, by the narration of a number of facts, conclusively demonstrated that the retention of a catheter after operation is, to say the least, perfectly unnecessary. (Mr. W. F. Teevan, p. 211.)

SUGAR IN HEALTHY URINE.—I regard the fact that sugar is susceptible of recognition in healthy urine as of the highest importance with reference to the glycogenic theory. It tells strongly against the validity of this doctrine. I strenuously contend that there is no active destruction of sugar carried on in any part of the circulatory system. If sugar reach the general circulation, whether from the liver or by artificial introduction from without, it is to be discovered in the blood in all parts of the system. Under natural circumstances, the blood contains only a minute proportion of sugar, and still from this minute proportion the urine acquires a recognisable saccharine impregnation. Such being the case, what, it may be asked, might be reasonably looked for if sugar were constantly being discharged from the liver as is maintained under the glycogenic theory? Passing off as it does with the urine in correspondence with its entrance into the general circulation, the exercise of a glycogenic function by the liver would involve in proportion to its activity, a more or less highly saccharine condition of the urine—the condition, indeed, which actually exists in diabetes. From a pathological as well as a physiological point of view the recognition of sugar as a constituent of healthy urine has a bearing of considerable importance. It enables us to reconcile ourselves to the instances in which sugar is incidentally met with to a moderate extent in the urine without being associated with any clinical significance. Every degree of variety is presented in the condition of the urine in relation to sugar, from the state belonging to health to that of confirmed diabetes. The two states are not separated from each other by a sharply defined line of demarcation. Sugar is encountered in the urine as one of the phenomena of idiopathic diabetes, but because sugar may happen to be encountered in the urine it does not follow that diabetes exists. (Dr. F. W. Pavy, p. 118.)

URETHRA.—*To Extract a piece of Broken Catheter from the Urethra.*—A piece of No. 8 silver catheter was broken off in the urethra, and would only move in the direction of the bladder. I took the eye off a No. 11 catheter, passed it down to and over about an inch of the broken end, when, on making an angle with No. 11, No. 8 became locked, and was easily withdrawn. This illustration of a simple method of extraction may be worthy of remembrance, and be employed with modification in the extraction of other foreign bodies. The size of the tube to be used will only be limited by the size of the meatus. On fixing the object to be removed by external pressure, the tube slides easily over it, and may, by manipulation, be extracted without any wounding of the mucous membrane, and without having recourse to an operation. (Dr. C. Young, p. 222.)

Extraction of Calculi arrested in the Urethra.—It is quite easy to pass a loop of fine silver wire behind a calculus impacted in the urethra—the calculus is not pushed before the wire as might be expected. On withdrawing the wire loop the calculus is probably caught and may be extracted. In order to retain the hold better I have had a slender silver canula constructed, which is to be used with the wire loop. The latter should first be passed well beyond the calculus, and the canula slipped over the projecting ends of the wire, and its point brought to bear against the stone, by which it will be steadied, then by making slight traction on the free ends of the wire, the loop will be brought against the calculus, which will thus be securely fixed between the wire and the mouth of the canula. The ends of the wire may then be twisted round the rings with which the canula is provided at its proximal extremity, and the apparatus withdrawn. By this mode of procedure, the foreign body being tightly fixed between the loop and the mouth of the tube, it cannot possibly slip out, and its extraction can be accomplished with the greatest ease. Although the canula I refer to is the most suitable instrument for the purpose, an efficient enough one can be extemporised by cutting a bit out of an old catheter; and in some cases the loop of wire will of itself be all-sufficient, as it was in the case just mentioned, and also in that of a child who had a calculus arrested at the bulb, and where a loop of wire was passed behind it, and slight pressure applied to the perineum to steady it, then by a jerking movement the calculus was brought well within the penile portion of the urethra, and by reapplying the wire and again jerking it was thrown out. (Dr. J. C. Ogilvie Will, p. 220.)

AFFECTIONS OF THE SKIN.

BURNS.—*Iodoform Ointment.*—Of all local applications in the experience of the writer, iodoform, prepared with extract of conium and spermaceti ointment, with a small portion of carbolic acid, appears to meet the several indications best. This agent acts as a certain and most effective sedative on the painful and irritable exposed surface, and at the same time as an antiseptic. It reduces irritation, inflammation, and suppuration when in excess, in a remarkable manner. It converts a most painful and irritable wound into one comparatively painless, with promptness. This remedy is also an excellent promotive of healthy action and of the healing process. I have experimented with iodoform ointment in these cases repeatedly, and always with the same pleasant result. The use of this preparation has another advantage; it

renders the constant use of anodynes unnecessary. The following formula has been found the best:—℞. Iodoformi, ℥j.; unguent. cetacei, ℥i.; ext. conii, ʒ iss.; acid. carbol., ♏ xxx. M. This ointment is spread twice daily on soft linen, and applied over the inflamed surface, and then enveloped in oiled silk. No other dressing is necessary. The only objection to the use of this remedy is its peculiar odour. In those cases of burns attended with great *dryness* of surface from destruction of vitality and want of exhalation, the wound, before being covered with the iodoform ointment, should be coated over with the common linimentum calcis. This affords a soft and moist dressing, which in nowise interferes with the action of the iodoform. (Edinburgh Medical Journal, Oct., p. 371.)

[illegible].—The pimple in which [illegible] may be destroyed by any [illegible] I venture to assert [illegible] may in like manner be destroyed [illegible] and other [illegible] [illegible] as far as my experience has gone appears to be these. 1. The acid must be [illegible] 2. It must be brought [illegible] with the diseased tissue [illegible] 3. It must be [illegible] [illegible] To this end, [illegible] [illegible] [illegible]

object by the use of the tincture of the perchloride of iron, either in erysipelas or any of the other diseases referred to in this paper, they will be disappointed, as such is the result of my experience both in erysipelas and diphtheria. Two illustrations may here suffice. I hold that a material difference exists between the effects of the two so-called similar preparations of iron—viz., the muriate and perchloride—both of which I have fully tested, and could give many instances of their marked therapeutic difference. In regard to erysipelas, I was attending a lady who was severely affected by it after a tedious attack of rheumatic fever. I ordered her to have thirty drops of the tincture of the muriate of iron every two hours; but to my great disappointment, I found that she went on day after day without any improvement. I then asked to see the medicine she was taking, when I discovered it was the tincture of the perchloride, sent by mistake by the chemist. I immediately changed the medicine for the tincture of the muriate of iron, and in a few days the disease disappeared. (Dr. Charles Bell, p. 43.)

PITYRIASIS CAPITIS.—*Chloral Lotion.*—In a paper read before the Société de Thérapeutique of Paris, Dr. Martineau recommends the treatment of pityriasis capitis by chloral lotions. He uses a solution of 25 grammes of chloral in 500 of water; this should be made lukewarm and applied every morning with a sponge. The rash and the pruritus rapidly disappear under the influence of the application. The immediate effects are redness of the skin and slight itching, but these inconveniences last only a few minutes. (Edin. Med. Journal, Aug., p. 184.)

PLASTIC OPERATIONS.—*Transplantation of Skin.*—It used to be thought necessary to success in transplantation of skin, that the transplanted portion should be connected with its original site by a neck of skin. This is not at all necessary, in fact it is rather adverse to the process. I have come to the conclusion that, if we wish a skin-flap to adhere to a new surface by the first intention or by agglutination, we must be sure that it is completely cleared of all areolar tissue, and properly fixed in its new place. In a case of formation of lower eyelid with skin from the forearm, I measured the size of the flap wanted, which in this case was two inches long, and nearly one inch broad. I removed the flap required from the forearm, and turned up the deep surface, and with a knife shaved off the subcutaneous tissue, so as to produce a clean white surface. (A small microscopic section-knife is best suited for that purpose; two of these should be at hand, as the binding tissue very soon deprives the knife of its edge.) When using the knife, the flap must be sup-

ported underneath by the middle-finger in order to feel the depth of the section. After having it properly cleared, and the whole surface white, I applied it to the gap, and so set it that the old cicatricial skin covered its edges all round like a frame, thus answering the purpose of stitches. The surface was covered with fine gutta-percha tissue, which enabled me to look at it every day without disturbing it, and a lint compress was placed above. On the third day the dressing was removed, and lint dipped in warm water was applied for some minutes, after which it was gently dried. The surface presented a whitish appearance, but adhesion had already taken place, and the wound looked quite clean and dry, the temperature being slightly above that of the neighbouring part. The silk ligatures were removed on the fourth day. On the seventh day I separated the upper from the lower eyelid, and you will see that union has already taken place all round the edges of the wound, and that the outer segment of the flap has even become slightly assimilated in colour to the neighbouring skin of the face. In short, you see that the skin-flap of two inches by one not only sticks in its new bed like a piece of court-plaster, but has already been partly assimilated to it, and this only eight days after the operation. (Dr. J. R. Wolfe, p. 275.)

PSORIASIS.—*Local Treatment.*—All crusts and scales having been removed as far as possible, and the absence of grease being ensured by wiping the parts with ether or rectified spirit, and the skin thoroughly dried, the solution of india-rubber is thickly applied with a brush over the affected places, and this application renewed as often as is needful for the formation and maintenance of a continuous covering of india-rubber over the affected skin. The chief difficulty I encountered lay in procuring complete adhesion of this covering, and in this respect I found india-rubber much superior to gutta-percha or collodion flexile, &c. A very good solution has been supplied to the hospital by Messrs. Allen and Hanbury, of Plough-court, and which answers very fairly when carefully applied. Its composition is, india-rubber half an ounce, chloroform eleven ounces and a half. Solutions in ether were not found so suitable as those in chloroform, for, from their more speedy solidification by evaporation, some difficulty was experienced in their use, especially in the hands of patients. This mode of treatment of course is not suited to cases in an acute stage, or in which excessive action is present. I have employed it in upwards of 50 cases, chiefly at the hospital, and in the majority the recovery has been more rapid than with the ordinary local measures. (Mr. Wyndham Cottle, p. 285.)

AFFECTIONS OF THE EYE.

ATROPINE POISONING BY OPHTHALMIC DROPS.—Some years ago, I wished to compare a sound eye with an amaurotic eye which I was about to examine with the ophthalmoscope. For this purpose I dropped into my servant's eye as well as my patient's, two drops of a solution of atropine, four grains to the ounce. This was repeated twice in the course of half an hour. In the evening, my servant complained that he felt very giddy and strange in his head, that he could not see; that his throat was sore; and that he could not swallow. His pupils of course were widely dilated, the throat was of a deep red hue. The pupils remained dilated for eight days. My patient complained next that she had had similar symptoms, and had nearly fallen down on her way homewards. The amount of atropine absorbed must have been infinitesimal, but the symptoms were undoubtedly those of atropine poisoning. (Dr. R. L. Bowles, British Medical Journal, April 29. p. 533.)

GLAUCOMA.—Von Graefe made many experiments with the object of relieving the tension of the eye in glaucoma, before he hit upon iridectomy. The clue was given by the observation that eyes from which a portion of iris had been excised in order to make an artificial pupil, or for any other reason, were often permanently softened. This observation led to experiments upon animals, and it was found that the excision of a broad piece of iris from a previously healthy eye invariably produced a state of subnormal tension. The change thus wrought was not tested by palpation alone, but also by introducing the needle of a hypodermic syringe into the anterior chamber, and by observing the height to which the aqueous humour would ascend in the barrel before the iridectomy, and again after the eye had recovered from it. The results thus obtained were sufficient to justify trials of the operation as a remedial measure upon the human subject. In 1856 von Graefe performed his first iridectomy for the cure of glaucoma, and at once removed from the disease the burden of utter hopelessness under which it had previously lain. We may say, as a general rule, that in the most acute cases the operation, if performed before perception of light is lost, will nearly always restore vision to the normal standard, and will prevent a recurrence of the affection. In subacute cases it will arrest the disease, but the restoration of sight will generally be only gradual, and will often ultimately be incomplete. In chronic cases the operation will usually arrest the malady, but is comparatively seldom followed by improvement; so that it cannot be relied upon to do more than preserve the amount of vision which

when it was performed. In these chronic cases, moreover, we sometimes find that the atrophy changes which the pressure had initiated refuse to be arrested, and that blindness, after all, closes the scene. (Mr. R. Brudenell Carter, p. 249.)

Glaucoma is a neurosis, and the immediate cause of the tension of the eyeball is tonic contraction of the sclerotic and not any increase in the fluid contents of the organ. I have also sometimes remarked that its closest pathological analogue is the curious contraction of the palmar fascia, not unfrequently met with in middle-aged and elderly persons. The contraction of the palmar fascia to which I refer is usually seen in front of the ring finger, and often involves the little finger also. It gradually and surely puckers up the skin and deeper parts a little below the finger cleft, and pulls the first phalanx down towards the palm. The skin and fascia become adherent together, but there is never any pain or inflammation. It occurs as frequently to those who do not do any work as to those who use tools, and probably has no connection with local irritation. Excepting that it sometimes happens to gouty persons, we can offer no conjecture as to any state of health which predisposes to it. It never occurs to young persons, is rare before middle age, and most frequent in early senile periods. It usually begins in one hand, and, after a while attacks the other also. It is irremediable. In most of these features it much resembles chronic glaucoma. (Mr. J. Hutchinson, p. 254.)

The etiology and pathology of all forms of glaucoma are the same; the essential feature being hardening of the globe from increased intra-ocular secretion, and more or less rapid destruction of the tissues involved. Simple glaucoma is consummated in a few years; sub-acute or remittent, as a rule, in a few months; acute or persistent, in a few weeks; and fulminating, in a few hours. The varieties thus briefly described shade off into each other, crop up during the progress of other ocular diseases, and are provoked in a secondary or traumatic form by accident or injury. They all end in total darkness, and are all curable by a timely and well-performed iridectomy. The differential diagnosis of a case of simple glaucoma from one of cataract is not quite so simple a matter as one would, *à priori*, suppose. It is still less surprising to find cases of remittent or acute glaucoma mistaken for iritis or other inflammatory affection of the eyeball. Indeed, the practitioner is here placed in an awkward dilemma. If the patient is suffering from iritis, and the attendant neglects atropine, he is responsible for an occluded pupil; if the case is one of glaucoma, and he employs atropine, the disease is sure to be intensely aggravated, an observation which, I

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$\frac{1}{15}$ of an inch in diameter, is drilled through that membrane, permitting the escape of some of the superabundant fluid in the chamber of the vitreous humour. This of course at once reduces the intra-ocular tension, but I further believe the reduction in the tension thus produced is likely to be of a permanent character, as the circular opening in the sclerotic must be filled up by new tissue which is of less firm texture than the original sclerotic, and will thus readily yield to any pressure from within, and act the part of a safety-valve should the contents of the vitreous chamber be at any future time again increased in amount. (Dr. D. Argyll Robertson, p. 265.)

Sclerotomy versus *Iridectomy*.—To make the sclerotic incision the knife is thrust through conjunctiva and sclerotic into the aqueous chamber as near as possible to and in front of the insertion of the iris, is carried across the aqueous chamber without sparing the iris should it interfere with the course of the knife, and is again thrust out through the sclerotic and conjunctiva (as near as possible to and in front of the insertion of the iris). Having thus made the puncture and counterpuncture. the incision through the sclerotic is completed (in the same manner as is usual when making a corneal flap for the extraction of cataract) slowly, especially when near completion, so that the knife escapes from the sclerotic beneath the conjunctiva without any jerk. Having reached the conjunctiva, the blade is placed flat upon the outer surface of the sclerotic, the cutting edge directed backwards, and while slowly withdrawing the knife from beneath the conjunctiva some of the latter is separated from the sclerotic. (Mr. C. Bader, p. 268.)

Granular Ophthalmia.—Granular ophthalmia is a disease liable to occur in persons who have lived for some considerable period under unfavourable hygienic conditions. A peculiar granular state of the palpebral conjunctiva becomes developed. On close examination small bodies closely resembling sago grains are seen situated in the structure of the membrane. They are most constantly present on the inner surface of the lower lid, near the outer canthus. The treatment of granular ophthalmia adopted amongst our out-patients is as follows: In the more recent cases the palpebral conjunctiva is twice a week touched lightly all over with the mitigated nitrate of silver stick (one part of nitrate of silver to three of nitrate of potash); after the application the conjunctiva is washed with a solution of salt and water. In the more chronic cases the greenstone (lapis divinus) is used instead of the nitrate of silver. In most cases sulphate of copper drops (cupri sulph., gr. ij., aquæ ℥j) are ordered to be dropped

into the eyes three times a day or oftener. If there be much intolerance of light or symptoms of iritis exist, gr. ¼ or gr. j. of sulphate of atropine is added to each ounce of the sulphate of copper drops. If there be copious purulent discharge alum lotion (gr. x. to ʒj) is ordered in lieu of the sulphate of copper drops. If extensive ulceration of the cornea exist the eye is ordered to be kept bandaged with lint soaked in belladonna lotion, and a fomentation of belladonna, or poppies, to be used at intervals; the granulations are neglected until the more severe symptoms have subsided. In some severe cases inoculation with pus from a case of purulent ophthalmia is performed, but such cases are always treated as in-patients. Inoculation is only applicable to cases in which there is dense pannus; if the cornea be healthy, or only slightly affected, it is very liable to slough during the course of the induced purulent ophthalmia. Inoculation is best performed by simply transferring some of the pus from a recent case of ophthalmia neonatorum to the conjunctiva of the person whom it is desired to inoculate. Purulent ophthalmia usually sets in in the course of twenty-four or thirty-six hours, and may be left to run its course without treatment. The granulations always disappear, and the cornea clears gradually, improvement often going on for three or four years after inoculation has been practised. If it is deemed advisable to inoculate in a case where one eye is healthy, the greatest care must be taken to shield the sound from contact of discharge. (Mr. C. Higgens, p. 269.)

PURULENT OPHTHALMIA.—In the more severe cases an energetic plan of treatment must be followed. The plan I adopt is as follows: When the patient first applies, the conjunctiva, both palpebral and ocular, is cauterised thoroughly with solid nitrate of silver, then washed with salt and water; the eye is then lightly covered with a piece of wet lint, fixed to the forehead with a turn of bandage, and allowed to hang over the eye. The patient (if treated as an out-patient) is directed to sit at home and constantly bathe the eye with alum lotion (gr. x to ʒj). Some simple ointment is ordered to be applied to the lids and cheek. If there is much pain three or four leeches are ordered to be applied to the temples. Quinine or iron, or both, are prescribed, and the patient directed to live well and take a fair amount of stimulant; if sleep is impossible, opium is given at night. Should the cornea be damaged the eye is kept bound up with a pad of lint soaked in belladonna lotion and a bandage, which are removed and the alum lotion applied as often as discharge collects. The patient is seen in two days, and if not improved the nitrate of silver is again applied; if improvement have taken place the patient

is ordered to go on with the alum lotion and medicine, and the nitrate of silver is omitted. (Mr. C. Higgens, p. 272.)

MIDWIFERY, ETC.

DILATATION OF THE UTERINE CAVITY.—On examining the records of the cases in which serious or unpleasant symptoms followed the attempt to dilate the uterus, I find they have generally occurred when practised. 1st. Either for the relief of dysmenorrhœa depending on the existence of a narrow cervical canal; 2nd. When the cervical canal is encroached by a fibroid of large size and unyielding structure; 3rd. When the process has been attempted to be carried out rapidly by means of metallic dilators, or, 4th. When it has been protracted over several days. I have therefore in order to guard as far as possible against the serious results recorded by others as following attempts to dilate the uterus, laid down for myself the following rules, which I can recommend with confidence to others. 1. Never to dilate the cervix uteri for the cure of dysmenorrhœa or sterility depending on a narrow cervical canal or conical cervix. 2. Never to dilate in cases in which a large and dense intramural fibroid presses on and partially obliterates the cervical canal. 3. Never to use metallic dilators of any kind, but to choose for the purpose either sponge or sea-tangle tents, which expand slowly and gradually. 4. Never to continue the process of dilatation for more than forty-eight hours. I prefer, in the few cases I have met with in which, after the lapse of that time, the cervix was not sufficiently opened to suit the purposes I had in view, to postpone all operative interference for some weeks, rather than risk the result by prolonging the dilating process. With respect to the first of these rules, I look upon the treatment of what is termed "mechanical dysmenorrhœa" by dilatation as being altogether a mistake. I doubt if any permanent benefit has ever resulted from it; while in several cases grave symptoms, and in one death, have to my knowledge followed the attempt. Equally, it is of importance not to prolong the dilating process. My own experience in the treatment of uterine disease requiring dilatation leads me to this conclusion, that unpleasant symptoms are likely to occur in a direct ratio to the length of time over which the process of dilatation extends. (Dr. Lombe Atthill, p. 309.)

HEMORRHAGE AFTER ABORTION.—Dr. Hubbard states that for the last twenty years he has made it a rule to leave the placenta entirely alone in abortion occurring at from one to four months. If hemorrhage is severe after expulsion of the fœtus he tampons in the following manner, and leaves the

case to itself. Take about one ounce of pulverised alum, tie it up in a fine cambric handkerchief, and leave the string attached. Introduce this little bag in the vagina and press it up against the os uteri. Behind this he usually places a piece of sponge, which also has a string attached to it, and the woman is then left. The next day this tampon is removed, and if hemorrhage occurs, another is introduced, and another day is allowed to pass. In a large number of cases the placenta will be found in the vagina quite certainly at the end of the second day. (Dr. Hubbard, p. 304.)

HYDRATE OF CHLORAL IN OBSTETRIC PRACTICE.—Chloral is capable of producing well-marked cutaneous anæsthesia. It can entirely relieve the pains of labour. Even when given in such large doses as to bring about a complete state of anæsthesia, it does not diminish the contractility of unstriped muscular fibres, including the uterus. Occasionally the pains of labour are rendered less frequent, but in such cases their force is correspondingly increased, or in other words the duration of the labour is in reality shortened. In those cases where the patient has become irritable or fatigued by a prolonged labour, in which the uterine contractions are diminished both in frequency and in force, owing to what may very properly be called *inertia uteri*, the administration of chloral to such a degree as to produce complete anæsthesia will almost invariably restore tone to the uterus, and by thus re-establishing the frequency and force of its contractions, speedily bring the labour to a successful termination. The administration of chloral as an anæsthetic has no injurious effect whatever on the child. The use of the drug is especially indicated in tedious labours and with primiparæ, inasmuch as it is rare to find such severe pains in multiparæ as in primiparæ. Hysterical and nervous patients are especially benefited by the use of chloral. It should be given after the first stage is completed and the expulsive pains have begun. In rare cases its use may be found advantageous during the first stage. It is best to obtain a solution so made that a teaspoonful of the mixture shall be equivalent to fifteen grains. The syrup of gooseberry is an excellent vehicle, as it effectually destroys the disagreeable after-taste of the chloral. The dose of the chloral should vary from one drachm to one and a half drachms given in two doses with half an hour's interval; or it may be given, when we do not wish too rapid an effect, in fifteen-grain doses every fifteen minutes. When its administration is followed or preceded by vomiting it should be given *per rectum*. Its use hypodermically is altogether too dangerous to be advised. (Dr. H. Chouppé, in Annales de Gynécologie, Practitioner, July, p. 52.)

ported underneath by the middle-finger in order to feel the depth of the section. After having it properly cleared, and the whole surface white, I applied it to the gap, and so set it that the old cicatricial skin covered its edges all round like a frame, thus answering the purpose of stitches. The surface was covered with fine gutta-percha tissue, which enabled me to look at it every day without disturbing it, and a lint compress was placed above. On the third day the dressing was removed, and lint dipped in warm water was applied for some minutes, after which it was gently dried. The surface presented a whitish appearance, but adhesion had already taken place, and the wound looked quite clean and dry, the temperature being slightly above that of the neighbouring part. The silk ligatures were removed on the fourth day. On the seventh day I separated the upper from the lower eyelid, and you will see that union has already taken place all round the edges of the wound, and that the outer segment of the flap has even become slightly assimilated in colour to the neighbouring skin of the face. In short, you see that the skin-flap of two inches by one not only sticks in its new bed like a piece of court-plaster, but has already been partly assimilated to it, and this only eight days after the operation. (Dr. J. R. Wolfe, p. 275.)

Psoriasis.—*Local Treatment.*—All crusts and scales having been removed as far as possible, and the absence of grease being ensured by wiping the parts with ether or rectified spirit, and the skin thoroughly dried, the solution of india-rubber is thickly applied with a brush over the affected places, and this application renewed as often as is needful for the formation and maintenance of a continuous covering of india-rubber over the affected skin. The chief difficulty I encountered lay in procuring complete adhesion of this covering, and in this respect I found india-rubber much superior to gutta-percha or collodion flexile, &c. A very good solution has been supplied to the hospital by Messrs. Allen and Hanbury, of Plough-court, and which answers very fairly when carefully applied. Its composition is, india-rubber half an ounce, chloroform eleven ounces and a half. Solutions in ether were not found so suitable as those in chloroform, for, from their more speedy solidification by evaporation, some difficulty was experienced in their use, especially in the hands of patients. This mode of treatment of course is not suited to cases in an acute stage, or in which excessive action is present. I have employed it in upwards of 50 cases, chiefly at the hospital, and in the majority the recovery has been more rapid than with the ordinary local measures. (Mr. Wyndham Cottle, p. 285.)

AFFECTIONS OF THE EYE.

ATROPINE POISONING BY OPHTHALMIC DROPS.—Some years ago, I wished to compare a sound eye with an amaurotic eye, which I was about to examine with the ophthalmoscope. For this purpose I dropped into my servant's eye as well as my patient's, two drops of a solution of atropine, four grains to the ounce. This was repeated twice in the course of half an hour. In the evening, my servant complained that he felt very giddy and strange in his head, that he could not see; that his throat was sore; and that he could not swallow. His pupils of course were widely dilated, the throat was of a deep red hue. The pupils remained dilated for eight days. My patient complained next that she had had similar symptoms, and had nearly fallen down on her way homewards. The amount of atropine absorbed must have been infinitesimal, but the symptoms were undoubtedly those of atropine poisoning. (Dr. R. L. Bowles, British Medical Journal, April 29, p. 533.)

GLAUCOMA.—Von Graefe made many experiments with the object of relieving the tension of the eye in glaucoma before he hit upon iridectomy. The clue was given by the observation that eyes from which a portion of iris had been excised, in order to make an artificial pupil, or for any other reason, were often permanently softened. This observation led to experiments upon animals, and it was found that the excision of a broad piece of iris from a previously healthy eye invariably produced a state of subnormal tension. The change thus wrought was not tested by palpation alone, but also by introducing the needle of a hypodermic syringe into the anterior chamber, and by observing the height to which the aqueous humour would ascend in the barrel before the iridectomy, and again after the eye had recovered from it. The results thus obtained were sufficient to justify trials of the operation as a remedial measure upon the human subject, and in 1856 von Graefe performed his first iridectomy for the cure of glaucoma, and at once removed from the disease the burden of utter hopelessness under which it had previously lain. We may say, as a general rule, that in the most acute cases the operation, if performed before perception of light is lost, will nearly always restore vision to the normal standard, and will prevent a recurrence of the affection. In subacute cases it will arrest the disease, but the restoration of sight will generally be only gradual, and will often ultimately be incomplete. In chronic cases the operation will usually arrest the malady, but is comparatively seldom followed by improvement; so that it cannot be relied upon to do more than preserve the amount of vision which existed

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and hence the serious risk of the deposition of fibrine in the form of thrombosis of the uterine vessels. Lactation and uterine involution follow closely on labour, and thus we have the woman's blood and tissues in a most inflammable condition, which it requires but little to ignite. Besides this, from the greater liability of such an extensive and important structure as the peritoneum to become affected, the prognosis becomes much more unfavourable in the puerperal than in the simple or surgical cases. But apart from these modifications, the difference is one of degree, not of kind. In both we have evidences of inflammation in the various textures anatomically composing the part affected, and it is the generally received opinion that there is no appreciable difference in the results in the two forms. In both we have the same nerve irritation and lymphangitis, the same exudation from the dilated capillaries; first of serum and lymph, and afterwards of leucocytes, the same phlebitis and thrombosis, the same inflammation of the cellular and muscular tissues, and finally, in the more malignant forms, the same gangrene and necrosis. Before using carbolic oil, I carefully wash both hands with liquor chlori (P. B.), and, after roughly drying them, make a complete and prolonged inunction with the oil as far as the wrists, thus allowing time for the epidermis to get thoroughly soaked before the examination is made. The odour of the dressings and discharges from the affected thumb and hand of Mr. Y. were most persistent; and, notwithstanding the most diligent use of the nail-brush and disinfectants, the fingers seemed constantly to exhale this offensive smell. Any one who has been accustomed to make frequent post-mortem examinations knows how pertinaciously the peculiar odour of the subject adheres to one's hands, and that it seldom disappears until the day following that on which the post-mortem was made. The reason appears to be that the increased temperature and more active capillary circulation which obtains when one is warmed in bed, cause greater rapidity in the cutaneous transudations and exhalations from the hands. When, however, inhibition by, and impregnation of, the epidermic cells, from prolonged contact with decomposing animal matter, is repeated twice daily for many weeks, it is not difficult to understand why it is that a continuous exhalation of an offensive character should be given off from these cells, in which, for the time, the septic matter would appear to have been stored and fixed. (Dr. G. Hunter, p. 327.)

As physician and pathologist in one of the largest obstetrical hospitals in Britain, Dr. Smart had ample proof that puerperal fever was septicæmia. He indeed considered it dangerous

for an accoucheur or medical man in practice to attend at a post-mortem. As to the question of puerperal fever existing as an epidemic, if they admitted it was a septic disease, then they got at the question at once. There was no epidemic of puerperal fever apart from direct septic influences. (Dr. Smart. p. 338.)

QUININE AS AN ECBOLIC.—Quinine undoubtedly has the power of inducing uterine contraction. In a case of convalescence from pleuro-pneumonia—the patient being between four and five months pregnant, quinine was given in doses of two grains every four hours on account of the prostration of the system. The following day, ten grains of quinine having been taken, uterine pains came on, and shortly afterwards a fœtus was expelled. The placenta not coming away, ergot was given; this however had no effect. On the following day the quinine was resumed; after the second dose uterine contractions were produced, and a second fœtus was expelled, the placenta soon following. (Mr. J. H. Wathen, Practitioner, July, p. 38.)

SPONGE TENTS.—*New Method of Using.*—Dr. Seyfert, Professor to the Gynæcological Hospital, describes and figures in Philadelphia Med. Times (July 8th) "the nearest approach to a safe and reliable tent," which is due to the "inventive brain" of Dr. J. A. M'Farran. His instrument consists of a small metallic or hard rubber tube, holding upon its perforated extremity a sponge-tent which is completely enveloped by a closely-fitting, thin piece of india-rubber. The rubber, while permitting the sponge to dilate to its fullest extent, prevents it from absorbing fluids from the canal, and protects the cervical mucous membrane from abrasions. Water reaches the sponge through the tube, which has upon its vaginal extremity a distensible rubber ball for its reservoir. Instead of limiting the rubber covering to the tent, it may be made to envelope the entire apparatus, thus keeping the tube in constant contact with the water which, by entering the perforations made in the tube, readily finds its way to the sponge. (Dublin Journal of Med. Science, Sept., p. 210.)

UTERINE FIBROIDS.—*Hypodermic Injection of Ergotin.*—The hypodermic injection of ergotin for the cure of uterine fibroids is liable to cause troublesome sores. I formerly added a small quantity of glycerine to the solution of ergotin, as recommended by Hildebrandt, I now employ a solution of one part of the extractum ergotæ liquidum B.P. in two of water, injecting 15 or 20 minims of this each time. I always insert the needle into the gluteus muscle, making it penetrate to the depth of more than an inch. These precautions much diminish the risk of abscess or sores.—(Dr.. L Atthill, p. 308.)

VAGINAL INJECTIONS.—*Modification of Higginson's Syringe.*—About fifteen month ago, Messrs. Maw, of Aldersgate Street, made at my suggestion, an addition of two and a half feet in length to the exit pipe of the ordinary Higginson's syringe, and a soft India-rubber nozzle five inches long, perforated with a number of holes for vaginal injections. The end to be introduced into the vagina is closed and rounded, and the open end slips over the ordinary bone or ivory rectal end. It is used as follows. The patient lies in bed, with the nates placed over a bed-pan, and the vaginal portion is introduced, the basin or reservoir being placed at the bedside, on a small table at or a little above the height of the patient's body. The suction pipe (weighted, if necessary, with a small piece of lead of two or three ounces to prevent its coming out) is placed in the reservoir, and the ball squeezed in the ordinary way, so as to charge the instrument with fluid, and then the whole tube, if the reservoir be placed above, acts as a syphon, and the injection is thoroughly applied without the least exertion or discomfort of position on the part of the patient.—(Dr. T. M. Lownds, p. 312.)

VESICO-VAGINAL FISTULA.—*Bozeman's and Simon's methods of operating compared.*—Our methods differ from each other in very essential points. While I operate on the patients in the supine position, with the buttocks much raised (an exaggerated lithotomy position), Bozeman makes use of the knee-elbow position, in which he fastens the patient. While I endeavour to draw forwards the parts bordering on the fistula, whenever this can be attained, Bozeman performs the operation while the parts remain in situ. While Bozeman pares the edges for the most part with scissors, I operate almost exclusively with the knife. While Bozeman employs a very complicated wire suture, I use a simple knotted suture of silk thread; and while Bozeman in the after-treatment keeps a catheter permanently in place, and often gives large doses of opium, I enjoin no measures of precaution whatever, but allow the urine to be passed at pleasure, and permit the patient to leave her bed even on the second or third day, if she pleases. (The late Prof. Simon, of Heidelberg, p. 233.)

ZWANKE'S PESSARY.—*New Form of.*—Zwanke's pessary is the one best adapted for general use, especially when the uterus has been completely procident for any length of time. There are however many objections to the forms in ordinary use, which will suggest themselves at once to any one familiar with their use. To obviate these Dr. Godson has contrived a modified form of the instrument. The upper part is made of vulcanite, and is extremely cleanly, light, and durable. The

lower portion or feet, employed for locking, is made of metal. Directly these feet come into contact, with the slightest pressure they lock, and they are as easily released by pressing with one finger upon the spring, and at the same time pushing the curved extremity down with the thumb. It may be suggested, that this portion will give pain by pressing externally, but this in practice will be found not to be the case. The patient walks about and sits down with perfect comfort. The expense—a very important item—is very little more than that of the cheapest form, while it will last out at least three or four of these. It is considerably cheaper than those varieties worked by means of a screw, whether made of vulcanite or metal. It is made by Arnold and Sons, West Smithfield. (Dr. Clement Godson, p. 314.)

The simplest form of Zwanke's Pessary.—The simplest and most durable material of which to make Zwanke's pessary is boxwood. It is invaluable in cases of procidentia. I keep a gutta-percha model, and get the boxwood pessaries made from it at the small cost of eighteen-pence each. Nothing can be simpler than this instrument, as there is no metal to corrode, and no joint or hinge. I think the projecting portion should not be made so long as it usually is, and its terminal half should be rather bulbous, It is peculiarly useful in hospital practice, as it cannot get out of order, and never wears out. The use of a little sand-paper may be required at long intervals to keep the surface perfectly smooth. It is very easy to introduce, and the patient, if intelligent, readily learns to withdraw it at night and replace it in the morning. It should be washed on removal, and kept in water during the night. In cases of procidentia, its use should be preceded by that of the tow-pessary for a week or ten days, or until the perineum has regained its natural power. It seems incredible to those who have not actually tried it, that such an instrument can prevent the uterus from falling out, for it is itself less in superficies than a plane drawn through the widest portion of the procident uterus covered by the inverted vagina. The reason is, that it does away with the wedge-action of the latter, and substitutes a flat surface, below which the perineum contracts instead of being gradually expanded and pushed back, as it is by the wedge-shaped uterus. (Dr. James Braithwaite, p. 316.)

MISCELLANEA.

ANÆSTHESIA.—*Nitrous Oxide and Ether combined as Anæsthetics —New Apparatus.*—By far the easiest and least unpleasant way of getting a patient ready for a surgical operation is to use gas

and ether combined; the gas being given pure during four or five respirations, and the ether gradually added as described. The supply of gas should cease when the ether is turned on; but if during the operation we have admitted so much fresh air that the patient seems conscious of the taste of the ether, we may, instead of increasing the ether, give a liberal supply of gas until the patient is tranquil. I find less sickness, and less complaint of the taste of ether afterwards, than when ether is used alone. (An apparatus for the single or combined use of nitrous oxide and ether is described and figured at p. 365.) The *advantages of the apparatus* are these:—1. It lessens the waste of ether, and consequently the odour of ether about the house. 2. The patient usually goes to sleep without any struggling, and is ready to be operated on in from one to two minutes. 3. The percentage of ether need not be so high as to produce coughing or swallowing, and it can be made stronger or weaker, as we wish, by merely turning a regulator. Lastly, patients recover rapidly, with less delirious excitement and less sickness, than if ether be given in the usual way. (Mr. J. T. Clover, p. 364.)

Bromohydric Acid.—This acid can be obtained by dissolving ten ounces, six drachms, twenty-eight grains of potassium bromide in four pints of water, and adding thirteen ounces, one drachm, thirty-seven grains of tartaric acid. The bitartrate of potash is precipitated and the hydrobromic acid remains in a clear, bright, almost colourless fluid, possessing an acid taste and the ordinary acid properties as well as the peculiar properties of potassium bromide, as compared with any other salt of potash. Dr. Fothergill has had a twelve-months' experience of the drug. It prevents, he finds, the occurrence of headache, which some people suffer from, after taking a dose of quinine. It is useful in nervous conditions, and, combined with quinine, is excellent in those cases where there is much nervous exhaustion from excessive indulgence in tea or in alcohol. It proves very serviceable in forms of excited action of the heart connected with general nervous excitability or nervous exhaustion. Given with quinine (of which it is a capital solvent) it gives better results than the bromide of potassium and digitalis. In all hysterical conditions, connected with ovarian excitement, it seems to have all the properties of the bromide of potassium. It is equally useful in the vomiting of pregnancy, and seems to exercise quite as powerful an influence over acts of reflex origin as does the bromide. It is especially adapted for the relief of hemorrhage associated with sexual excitement, and is even more effective here than the bromides themselves. It is also of use in whooping-cough, combined conveniently with

quinine. With spirits of chloroform and syrup of squills it forms a most agreeable and palatable cough mixture. Where there is gastric irritability it is the most useful of all acids. The dose, prepared as above, is one drachm as a full dose. (Dr. J. Milner Fothergill, p. 356.)

COCA.—The chewing of cuca removes extreme fatigue, and prevents it. Hunger and thirst are suspended; but eventually appetite and digestion are unaffected. No injury whatever is sustained at the time, or subsequently in occasional trials. Nearly all travellers on the Peruvian and Bolivian Andes use the drug as a remedy for that effect on the brain and lungs produced by rarefied air, which in South America is called "zorroche." One use to which it is put by the Indians is that of a "pick-me-up" after a debauch on alcoholic fluids. In Bolivia it is generally eaten with a paste made of wood-ashes and potato. Coca would seem to be inhibitory as regards the action of the heart. Whether this result is produced by indirect action through the mental functions upon which the drug is said to act remains to be proved. The hints afforded in the meantime may prove of great value. Coca in sufficient doses would seem to be a powerful nervine tonic; and its effects appear to be entirely harmless. (Sir R. Christison, Dr. A.L., pp. 341, 346.)

FERRUGINOUS PREPARATIONS IN SPECIFIC AFFECTIONS.—All the preparations of iron, and more especially the perchloride and the pernitrate, will prove of considerable avail as a therapeutic, antiseptic, and preventive agent in all specific and zymotic maladies—viz., enteric fever, cholera, septicæmia, erysipelas, adynamic, puerperal fever, &c. We know that the hæmatinic virtue of this drug is largely needed in the cure, as well as in the prevention of these affections. It ought to be commenced with from the outset in large and repeated doses, from a drachm to two, of the tincture or liquor of the perchloride, or the liquor of the pernitrate, freely diluted in about three or four ounces of iced water. The remedy may as well be administered per rectum, especially in cholera and typhoid. In addition to being administered in cases of actual cholera and typhoid, it would prove of no inconsiderable avail if we could enforce its use in cases of premonitory diarrhœa of the former, or even give it, but in small quantities, to apparently healthy individuals when the diseases are prevailing in epidemic form, or when there is reason to expect an outburst of either. This latter is specially applicable with regard to troops, who have sanitary as well as medical supervision. (Mr. J. C. Lucas, p. 357.)

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ART. 1.—ON SEPTICÆMIA.

By S. MESSENGER BRADLEY, Esq., Surgeon to the Manchester Royal Infirmary.

In June last year I admitted a man into the Manchester Royal Infirmary with hydrocele of the tunica vaginalis, which had resisted ordinary means of cure. The day after admission I tapped him once more, when, for the first time, I discovered a second sac, encysted hydrocele of the cord, on the same side. This I also tapped, and injected both sacs with tincture of iodine. This little operation was followed by suppuration, and on the third day by grave constitutional disturbance; temperature rising to 103°, and the pulse to 130; countenance anxious; tongue dry and furred; much restlessness, profuse sweatings, and rigors.

The sac of the tunica vaginalis was freely laid open and half a pint of fetid pus evacuated. The general symptoms were for a short time relieved; but the following day diarrhœa ensued, the temperature again rose, and the patient died delirious six days after the paracentesis had been performed. There was no evidence of thrombosis, embolism, or visceral abscesses; in a word, the man died of septicæmia.

A few months after this, Walter Searson, curator of the Owens College Medical School, pricked his thumb while dissecting a tiger for the museum, and two days afterwards began to suffer pain at the seat of injury. On the fourth day he called to see me, when I found a small quantity of thin fluid discharging at the root of the thumb-nail. The lymphatics were perceptibly affected, the skin was cool, the tongue dry, pulse 100; but perhaps the most noticeable symptom was intense depression of spirits. I freely incised the thumb and sent him home to bed: this was Aug. 22nd. From this day his general condition grew worse, up to the 26th, when an ill-defined, or rather an undefined, abscess appeared in the cellular tissue of the arm. On being opened several ounces of pus were discharged, which lay loosely in the tissues unconfined by any limiting membrane. Each day fresh abscesses of the same diffluent character ap-

peared on the chest, abdomen, legs and feet. He was very restless, and passed gradually from a condition of prostration into one of muttering delirium, which ended in death on September 11th, twenty-four days after the reception of the poison. The secretion of urine was almost entirely suppressed for the twenty-four hours preceding death, and the breathing was both rapid and difficult, auscultation revealing extensive moist crepitation of both lungs. There was no post-mortem, but this was clearly a case of pyæmia.

At the same time that the man with hydrocele lay dying of septicæmia, a youth with a compound fracture of his leg was brought into the same ward. He was a healthy lad, and there was nothing in the case to cause alarm; indeed, it was one of those cases of which, with proper surroundings, we may safely predicate a sure and speedy recovery. After lying, however, in juxtaposition to the septicæmic patient, the young fellow fell a victim to the same disease, and it was only after two months of great peril that he contrived to drift through the disease into a slow convalescence.

These three cases may serve as types: the first arising *de novo*, the septic material being manufactured by the patient himself —a consequence only possible in certain conditions of the system. This is the class of case met with in private practice. The second case illustrates the production of the disease by direct inoculation from without; while the third affords an illustration of the mode in which the malady is conveyed in hospital from patient to patient.

I draw no distinction between septicæmia and pyæmia, believing that if there is a distinction, it is a distinction without a difference. Both are caused by organic matter (septic germs) entering the general system: in the first and third cases entering probably by the veins; in the second by the lymphatics. In the first case the poison killed without visceral lesion; in the second it gave rise to thrombosis in the veins, which, being detached, became the nuclei of suppurations scattered throughout the cellular tissue generally and the various viscera. But clearly these are only unimportant varieties of one pathological condition, which we may conveniently term septicæmia.* Now

* I am quite aware that Drs. Moxon, Goodhart, and others, have examined the blood of patients dying of pyæmia without finding bacteria. I should imagine in most cases of pyæmia without wounds communicating with the air—when, for example, the disease commences in a necrosis—there would be few bacteria present; but in many respects this clearly differs from the infective form of the disease, where the evident origin of the evil is putrefying organic matter. I conceive that in all cases of septicæmia the constitutional condition of the patient must play a large part; even in such a disease as ringworm, where the producing organism is, comparatively to the minute bacteria, gigantic, the patient himself greatly influences the development of the fungus. As easily try to grow corn in water as ringworm in certain human soils, and it is so probably with the poison of septicæmia.

in studying this condition of septicæmia, we shall learn something of its nature and how to prevent it by turning to another variety of the same disease—I mean that form of puerperal fever which depends for its production upon puerperal peritonitis. As in ordinary pyæmia, cases of puerperal fever occur sporadically, so to speak—spring up away from a hospital, in patients surrounded by everything which we should consider antagonistic to its development. In these cases, however, we can nearly always trace the presence of some putrefying organic matter—a bit of placenta, &c.,—just as we can in isolated instances of pyæmia; as in ordinary pyæmia, too, puerperal peritonitis is clearly contagious, conveyed with fatal certainty from patient to patient by the hands of doctor or midwife.

We can, however, advance still further towards a conclusion as to the real character of the poison and as to the mode in which it must be destroyed. The experiments of Chauveau and Burdon Sanderson demonstrate that if a septic fluid capable of producing toxæmia when injected into the veins of a living animal be strained through a porcelain filter, the liquor so filtered may now be injected with impunity, whereas the solid residue remaining on the filter retains in full force all the septic properties of the original fluid matter. This residue is shown to entirely consist of bacteria. Whether these bacteria be the very incarnation of the poison, or merely act as beasts of burden for it, is a question which exercises the minds of curious men, but need not here detain us, having established the fact that bacteria are essential to the production of septicæmia.

We have learned a good deal of late about these organisms. We know, amongst other things concerning them, that they are heavier than air—e.g., in Tyndall's recent experiments upon the non-septic properties of optically pure air it is shown that three days suffice for gravitation to deposit all the floating germs upon the bottom of the little boxes which he uses; and that the poison of septicæmia is likewise of a comparatively heavy nature is evident in the clinical history of puerperal fever, which teaches us that the spread of the disease may always be traced to human go-betweens, and is never conveyed from patient to patient by mere diffusion through the air. It is of course possible that, in a crowded hospital, poison-germs may be wafted from the wound of a septicæmic patient and alight upon the open sore of a neighbouring case, when it will, in turn, give rise to the disease; but the whole history of septicæmia differs markedly from diseases which, in their wide and rapid spread, seem to depend upon the diffusion of septic gases.

Assuming, then, the point to be conceded that septicæmia does not depend on gaseous diffusion, and coupling the facts that it never occurs without putrefying organic matter and that

putrefaction requires the presence of living germs, we are not postulating too much in affirming that the destruction of the germs must render the spread of the disease impossible. To what practical issue does this lead us? You all know what just odium attaches to the surgeon who, after one clear case of puerperal fever, allows himself to become the medium of its conveyance to another victim; not only moral pains and penalties are his, but the arm of the law deals with him sharply. Now I confess it seems inconsistent to be so careful in one case and so careless in the other. All authorities admit the contagiousness of pyæmia; nearly all agree that it is carried only by actual contact from case to case; and yet we see, every day, cases of pyæmia remaining in wards crowded with open wounds (wounds with open vessels ready to absorb everything, good or bad), and all these cases under the care of the same surgeon, house-surgeon, and nurses. Surely it is not asking too much to insist upon a separate ward, where any case of septicæmia should be transferred, and which ward should be looked after by an entirely separate staff of attendants.

But, it is not enough to isolate our cases; we must purify our wards; and this subject naturally divides itself into two:—1st. What test have we, besides that of the ill-doing of our patients, that our wards are impure? 2nd. What are the best means of purifying them? Unfortunately chemistry, to which we naturally turn, yields no satisfactory reply as to the detection of organic impurities. But it does give us an answer, though in a somewhat roundabout way; for, having discovered that the quantity of carbonic acid in the air is constant, being almost exactly the same in a London court and at the summit of Mont Blanc, and that any excess in the carbonic acid is an indication of organic impurities in the air,—in this way chemistry does enable us to get at some precise results. Let us, then, adopt this method of investigation in examining the condition of our own hospital. In accordance with my request, Mr. Thomas Harrison, F.C.S., a very competent authority, on January 14th of this year, examined the air of certain wards in the hospital with the following results:

Estimate of the quantity of CO_2 in 10,000 *volumes of air.*

Average quantity of CO_2 in 10,000 volumes of Manchester air, 4.

President ward	18
Humphry Nicholl ward	8
Passage adjoining	4

I shall not further allude to the condition of the President ward than to say that, be the cause what it may, such a condition of air as is here revealed is an unfit atmosphere for sick people. What I wish more particularly to draw your attention to is the

condition of Humphry Nicholl ward. Owing to a recent epidemic of erysipelas, this ward had been cleared out a month before the analysis was made, and both windows and ventilators kept open ever since; yet we find that the quantity of carbonic acid is exactly double that in the adjoining passage. If you ask me how I explain this remarkable fact, I can only answer that I imagine it to be caused by hordes of bacteria which are for ever discharging carbonic acid into the air like so many little Christians. This supposition, which I quite admit seems somewhat fanciful, receives support from another experiment performed by Mr. Harrison, who, on January 16th, examined the air of the ashpit of his back yard. On this occasion he found 14·08 parts of carbonic acid in 10,000 volumes of air. Having ascertained so much, he discharged a quantity of ozone for thirty seconds, and then found only 10·2 parts of carbonic acid. Now, as ozone has no effect upon carbonic acid, this result is only explicable on the theory that ozone arrests the fresh formation of carbonic acid. We know that ozone destroys the life of bacteria; we know also that bacteria emit carbonic acid: hence it seems a fair inference that the extraordinary quantity of carbonic acid is due to the presence of aerial hosts of these minute organisms.

That bacteria do exist in the air of our hospital is quite certain. In 1868 Mr. Lund examined the air of the hospital, and found bacteria in abundance. Dr. Dreschfeld, at my request, lately exposed some papers moistened with water and glycerine to the air of some of the hospital wards, and found bacteria, though, he informs me, in very small numbers. I supplemented his experiments by repeating those which Mr. Lund had made, and found that the distilled water with which the flasks which I used were filled became turbid with bacteria in a few days.

Now, bearing in mind the fact that ozone destroys organic matter, and remembering that it is organic matter which gives rise to the putrefactive changes of septicæmia, let us inquire how we can practically bring this agent to bear. I find that the air of Manchester is absolutely devoid of this natural antiseptic, but it fortunately happens that nothing is easier than to manufacture ozone, and this, too, quite on a grand scale. With a Rumkopf coil, such as this, and one of these generators of Tisley's, you could fill the largest ward in this hospital with ozone in a few hours. Now that I put the battery in action, so as to electrify the oxygen as it passes through the tube, you see the gas in its changed state coming off in large quantities, blackening this prepared paper, and changing this solution of starch and iodide of potassium into a deep and beautiful blue. Without venturing to affirm that every antiseptic acts simply as

an oxidising agent, we may safely affirm that no antiseptic is so potent as nascent oxygen or ozone; hence it seems to me that when an epidemic of septicæmia has vitiated the air of our wards we should resort to this agent for purification.

These experiments, to which I have before alluded, may be taken as proving that the air of the hospital is impure; yet, if we examine our statistics, we find that they compare favourably with those of most other hospitals. The best cases to take are probably amputations, as they are numerous enough to afford reliable grounds for comparison, and do not depend for their result on any special skill in the operator. Professor Simpson, whose *hospital* statistics were never impugned, stated that "all amputations of all the four limbs in eleven of the largest general hospitals of the country gave a mortality of 41·6 per cent., or nearly 1 in 2·4." Erichsen found that 80 consecutive cases of amputations at University College Hospital, from July 1st, 1870, to December 1st, 1873, gave a mortality of 26·2 per cent. Of 307 amputations performed by himself, 79, or 25 per cent., died. At our own hospital, from 1868 to 1873, 304 amputations, whose results are tabulated, were performed, excluding all amputations of the hand and lower third of forearm and of the foot and ankle. Of these 77 died, giving a mortality of 25 per cent.; if, however, we include the previously excluded amputations, we reduce the mortality from 25 to 20 per cent., being 2 per cent. below that of University College Hospital, and 2 per cent. above that of St. Bartholomew's, where the mortality of late years has been reduced to 18 per cent. But, although by cleanliness and care we have reduced the mortality to a percentage which compares favourably with that of the best metropolitan hospitals, we should not rest satisfied with such a result when we are acquainted with the fact that in a bygone generation, and with ruder means at his command, Guthrie, during the Peninsular war, lost but one case in twelve of all his amputations, being a mortality of only 8 per cent. We should not, indeed, justly rest satisfied until we have achieved an equal success with his, especially when we know the only cause for the great disparity lies in the comparative purity of the air. At the debate on pyæmia at the Clinical Society last year, Spencer Wells and Dr. Gordon made statements bearing upon this question, the one referring to the hospitals at Malta, the other to the Parisian ambulances during the Franco-Prussian war; their statements prove that the mortality was ever in direct proportion to the quality and quantity of the air.

As I have said, there is no ozone in the air of our city, but it is abundantly present in the outskirts, and these papers, which are so deeply coloured by ozone, received the tinge by being

exposed for a few hours in that of Oxford-road, where the Infirmary Committee urge the erection of the future hospital.

To what conclusions do these thoughts lead us? Let me briefly restate the case by way of answer. I have endeavoured to show that pyæmia, septicæmia, and puerperal peritonitis (all varieties of one disease, which may be generically termed septicæmia) are associated with the development of organic germs, "bacteria," which act either as the carriers of the poison or as the poison itself; that septicæmia may be, and is, carried in a hospital from one patient to another by surgeon or nurse; that all cases of septicæmia occurring in a hospital should be at once removed and effectually isolated from contact with the other cases; that as ozone destroys the vitality of bacteria, ozone should be employed to purify our wards when septicæmia has appeared in them; that this may be readily effected in a few hours by means of a small battery and Tisley's ozone generator; that the air in the Manchester Infirmary is impure, and therefore deleterious, but that, notwithstanding this, our death-rate, in consequence probably of the great attention paid to cleanliness, compares favourably with that of other hospitals; that, however, when we recall the achievements of Guthrie in the Peninsular war of sixty years ago, we must consider this mortality really excessive, and should constantly urge the necessity of our hospital being built on better principles and in a purer air.—*Lancet*, *May* 27, 1876, *p.* 768.

2.—IS ENTERIC FEVER EVER SPONTANEOUSLY GENERATED?

By Dr. R. Bruce Low, Medical Officer of Health, Helmsley Rural Sanitary District.

In answer to this query, and acting on the advice given by Sir William Jenner, quoted by Dr. Fox in the Journal of March 25th, that "the best mode of settling this question is to thoroughly scrutinise every isolated case that occurs in out-of-the-way country places," I submit two groups of isolated cases which occurred in my out-of-the-way country district. The first group consisted of four cases, all occurring in the same house about the same time. The house itself was a moderately large one for a cottager, consisting of four fair-sized rooms. The family consisted of four persons, three adults and a boy of four years. The situation of the house was most peculiar. It was built on a hill-side, facing the junction of four wide valleys; a more exposed situation could hardly be imagined. Above the house were miles of moorland; the house was some distance from any high road, and altogether so out-of-the-way, that it was impossible that any tramp infected with enteric

fever could have found out the house, far less the privy which turned out to be the source of the mischief. The father of the family was the first victim; within a week his wife was taken ill; in another week the daughter; and, finally, a married daughter, who had come to nurse them, also took the disease. All the four persons were ill in the house at the same time; the little boy escaped (not having used the privy). Two sons came to help to nurse their relatives, and, by my advice, did not go near the privy; also a trained nurse, who ultimately took care of them. The father and the married daughter died. The other two recovered. The water supply was examined and found pure; the house was clean and commodious. The privy was found running over, and so full of filth that the seat could not be used. The fact that all the sufferers had used this privy, and that those who were afterwards exposed to the same conditions (with the exception of the foul privy), as well as the double danger of the typhoid stools from the four individuals, never took the disease—all this points to some local exciting cause, viz., the privy. In addition to this, when we consider the exposed situation of the house, its isolated position, to which a person (a tramp, for instance, who is the vehicle for carrying about the disease, according to the belief of some) suffering from enteric fever could not have climbed, the road being both steep and difficult to find; when we consider the pureness and abundance of the water-supply, and the entire absence of enteric fever from the district, which is very thinly populated; combining these facts with the circumstance that neither the father nor any of the others had been out of the district for a very long time, nor had they had any visitors, we are driven to the conclusion that the disease was generated *de novo*, and that there could have been no exposure to a specific contagion. I may state that the privy was disinfected and cleaned out, and, although a new family has occupied the house since the outbreak, no fresh cases have occurred.

The second group also consisted of four cases. Two little boys, attending a day school, had an attack of diarrhœa. One of the boys passed his evacuations in bed during the night, but was able to go to school next morning. The mother of the boys employed a charwoman to assist her in washing the soiled bed-clothes. An aunt of the boys resident in the house also assisted. Within a week these three persons were seized with symptoms of enteric fever, which developed rapidly, and proved fatal to the mother and to the aunt. All three, when engaged in the cleaning of the soiled linen, were nauseated by the foul smell of the evacuations. The house was a fairly built one, and contained twelve inmates (six adults and six children). The drainage was perfect, the water-supply pure and constant.

No cases of enteric fever existed in the district. None of the family had been from home; they had had no visitors. The privy was clean, and as wholesome as could be expected. The two boys attended school all the time they were ill (a few days); their appetite and general health were not affected. The school was airy and well ventilated; none of the other scholars were ill. No source of contagion could be traced. Was the diarrhœa of the boys the manifestation of enteric fever in a mild form? If so, then the infection of the three persons is at once accounted for; but it is open to doubt if this diarrhœa was that of enteric fever, for in no way could any source of infection be found which would account for their having taken the disease. In the absence of any proof to the contrary, we must admit that the disease began from the inhalation of the fœtid stools of the boys; that the emanations from these stools poisoned the systems of the three individuals who inhaled them, and the "filth fever" was thus generated. I have omitted to mention that one of the children, who remained in the sick room with its mother during her long illness, also took the disease and died from it, the mother clearly infecting the child; but none of the other children or the other inmates of the house suffered from the disease. In conclusion, I may state that the privy in the garden of the house was quite inaccessible to any tramps, who might have left in it their infected stools, so that this theory, which meets many of the obscure cases, is not tenable in this instance.—*British Med. Journal, May* 27, 1876, *p.* 659.

3.—THE PROPAGATION OF ENTERIC FEVER BY INFECTED MILK: THE EAGLEY OUTBREAK.

In February last the valley of the Eagle (Eagley) in Lancashire, a circumscribed adjacent district, and part of the borough of Bolton were the scene of a sudden outburst of enteric fever. The explosiveness (for this word perhaps best characterises the early phenomena) of the outbreak and its severity were remarkable, and gave to it a general interest, which was particularly marked by its being made the subject of a Government inquiry and of sundry questionings in Parliament. This interest was augmented when it became known that Mr. Robinson, the Medical Officer of Health of the district, had, upon strong *primâ facie* grounds, attributed the outbreak to the distribution from a certain dairy-farm of milk specifically infected; and that this opinion had been largely confirmed by Mr. Sergeant, the Medical Officer of Health for Bolton Borough, who, ascertaining that milk from the implicated dairy was sold in Bolton, had discovered that the families

purchasing and using this milk had suffered not less severely from enteric fever than the families using it in Eagley.

The Government inquiry was carried out by Mr. W. H. Power, one of the Medical Inspectors of the Local Government Board. His report of the inquiry has just been made public. It is a model of what such reports should be, and of the sort of inquiry it describes; and it confirms fully the conclusions which Mr. Robinson and Mr. Sergeant had previously arrived at on the source of the outburst. The report is unfortunately too long to be reprinted *verbatim* in our pages, but in the accompanying account of it we shall retain Mr. Power's words in all the essential parts.

Eagley, for the purpose of the report, is described as including Eagley Bridge, Eagley Bank, Hough Lane, Toppings, Dunscar Lane, and part of Cox Green, populous places situated on the coal measures and millstone grit on and about the river Eagle. Enteric fever is the common fever of the district, and during the past five years two deaths annually from this disease have, on the average, occurred in the registration sub-district of which it forms a part. The population of the Eagley district thus described numbers 1625 persons, living in 318 dwellings. The local industries are mainly in thread-mills, paper-mills, bleach-works, stone-quarries, and agriculture. The different groups of dwellings have, as to drainage, simple surface drains, mostly constructed of rubble. They are as a rule provided with the old-fashioned filthy middenstead privies, and they derive their water-supply from several distinct sources. No one sanitary defect of dwelling likely to promote a concurrent diffusion of enteric fever was common to all, or the greater number of, the houses affected with the disease, and an account of the different existing defects may therefore be spared. In what follows we copy closely Mr. Power's report, chiefly omitting some tabular matter.

Eagley, during the last few months of 1875 and early days of 1876, had been comparatively free from fever or other illness. But towards the end of January a few dropping cases of what subsequently proved to be fever preceded a great outburst of illness on the 30th of the month. The earlier cases, occurring in eight families, presented no very definite symptoms, and did not come under any medical observation until the simultaneous occurrence of other and well defined cases had excited general attention. On the day of the outbreak, January 30, there were newly attacked 14 families and 20 persons. In the next six days, to February 5th, an additional 103 persons, the number of families attacked now amounting to 50. After this date the outbreak declined. In four days to February 9th, 28 persons were newly attacked, 55 families being now involved; in six days,

to February 15th, 15 persons were newly attacked, the number of families having cases in them now amounting to 59; and to the end of February there were 13 fresh attacks, and 62 families now had cases of the fever in them. In March there occurred four fresh cases in families previously attacked, and in April one case in a fresh family. In all there have been, in 63 households, 195 cases with 13 deaths. The facts of special interest in the outbreak have been:—sudden inception, rapid culmination and decline, peculiar limitation to particular parts of the district and to particular families, and above all, in regard to many cases, the sudden and urgent character of the earlier symptoms. These symptoms were such as to leave the nature of the illness for the moment in doubt, and to non-medical minds were even suggestive of vegetable or mineral poisoning. Extended observation on the part of the medical men attending the cases, with such evidence as I myself was able to obtain, have made it certain that fever and nothing else was the disease under which all the patients suffered. The great majority of them had well-marked enteric fever.

A smaller number had fever of a less definite character, the "simple continued fever" of books. A few persons, indeed, only suffered for a day or two with headache, pains in the limbs, vomiting or nausea, and general malaise, the same symptoms which in graver cases served to define the commencement of illness. They are reckoned in the above total of 195. Excluding the fatal attacks, and those persons who were ill a few days only, the average duration of illness of 133 cases of fever respecting which particulars of this sort were obtainable, has been 36·9 days."

It appears that of 57 families in Eagley supplied from a particular dairy, no less than 55 (96 per cent.) were attacked by fever, while of 261 other families in the same district supplied from other sources (or not taking milk), eight (3 per cent.) only were attacked. As regards these eight families attacked by fever, though not taking the milk, examination of the circumstances of their attack served but to add additional force to the evidence implicatory of the particular dairy. In six of the eight the members attacked had prior to their illness partaken at neighbours' houses of the milk in question; in another of the eight the disease, though called "fever," had not been medically recognised as such, and the origin of the disease, whatever it was, could not be traced; and in the last of the eight exceptional cases the fever occurred at a later period, in April, and was referred by the medical man in attendance to the use for drinking of water presumably infected by pre-existing cases of fever.

Further, in several instances persons not residents within the

area of the milk supply were, after partaking exceptionally of this particular milk while visiting friends in Eagley, attacked by fever.

The evidence connecting the outbreak with the milk supply is strengthened by the special incidence of fever on habitual drinkers of raw milk. Particulars of the habits as regards milk consumption by individuals were obtainable respecting 35 families, comprising 161 persons. Of these 83 habitually drank milk in a raw state, while 78 took it in tea or coffee, or did not take it at all. Of the former 79 (95 per cent.) and of the latter 18 (23 per cent.) were attacked.

As regards the characters of the milk in question, so far as they were of a nature to be recognised by the consumer, it has to be noted that the milk was almost unanimously voted poor, and many persons complained that it had an undue tendency to become sour. Towards the end of January last it was generally noted that something was wrong with the milk; it turned sour almost at once, and is described as having been of a peculiar colour, to have tasted unpleasantly, and even to have smelt offensively. In many instances the milk, after standing, left at the bottom of the vessel containing it a sediment variously described as grit, sand, or dirt.

The above evidence seems conclusive that milk from the dairy in question has in Eagley been concerned in the dissemination of fever; but the operations of this dairy were not confined to the Eagley district. One half of the total milk of the dairy was habitually retailed in Bolton town, two or three miles distant. This fact, shortly after the outburst of fever at Eagley, became known to Mr. Sergeant, Medical Officer of Health of Bolton Borough, who forthwith undertook inquiry respecting the distribution of this milk within his district, and found that wherever in Bolton this milk had been consumed there also there had been fever. Some of the first results of this inquiry are here given in Mr. Sergeant's own words:—"The localities chiefly affected were the districts about Turton Street, Waterloo Street, Moss Street, and Back Street, Little Bolton; and Burns Street, Back Foundry Street, and Foundry Court, Great Bolton. The disease followed unerringly the track of the milk supply from (the particular) farm. Not one household to which the milk was traced did I find entirely free from disease; the houses, clean or dirty, were attacked indiscriminately. In one house only was the drainage defective, and here a death occurred which might possibly have been influenced by the unsanitary condition. Besides the cases recorded as definitely due to the milk, there are several others which are somewhat doubtful, and also probably a few that have not been found out, as

a list of the houses supplied with the milk could not be furnished."

As to the means whereby the milk supply of the particular dairy became infected, it had occurred to the local people to suspect the actual milk of the cows, or of some cow, as having contained the fever material. But, seeing that we are ignorant of any disease in the cow that can give rise to specific enteric fever in the human subject, and seeing also that we have experience of many like outbreaks where the milk served as the vehicle (and perhaps also as the multiplying ground) of fever-material derived from human subjects previously infected with the fever; it is plain that this suspicion could not be entertained until after exclusion of the better understood conditions. On making inquiry into the circumstances of the inculpated milk supply in the Eagley-Bolton epidemic, however, there soon appeared (and this even after the lapse of two months from the commencement of the outbreak) evidence pointing conclusively to the now familiar condition of contamination of the milk by infected water used for dairy purposes. The special circumstances of the dairy farm in question are briefly as follows:—

Situated upon the hillside at Toppings, the farmhouse depends for its water supply upon a brook. Water from this brook, led in drain pipes to the farm-yard, is there stored in a series of tubs placed at different levels, but connected by overflow pipes one with another. From this arrangement it has resulted that the uppermost tub has served as a catch pit for whatever matters the brook has brought down. Water from this tub was, prior to the outbreak, habitually in use for dairy purposes. Now, the brook is fed by springs rising at a high level east and north of Toppings, and it formerly served as the water supply of other dwellings besides the farmhouse. But the recent building of a large mill near to the course of the stream, a couple of hundred yards above and on higher ground than the inhabited area of Toppings, had led to such obvious defilement of the stream that its use for drinking purposes had been for many months prior to the outbreak, with exceptions immediately to be mentioned, wholly discontinued. It seems that workmen engaged upon the mill had since its commencement habitually resorted to the banks and bed of the brook for the purpose of defæcation. In consequence of this fouling of the stream, the tenants of certain cottages near at hand, who up to this time had obtained their drinking water from the brook, had been compelled to resort to a well at a considerable distance. The family at the farmhouse and another family at Windsor Hill Cottages alone continued to use the brook water; the former was attacked by fever about the same time as other persons in Eagley; the latter (consisting of two adults who

took the precaution of boiling the water before using it) escaped illness. As to the condition of the brook at the commencement of the outbreak, Mr. Robinson reports that he found upon its bed and banks "large quantities of fæcal matter;" and Mr. Sergeant, who visited it about the same date, found its course "conspicuously polluted by the fæcal deposits of large numbers of men employed in erecting the mill." It is not known that enteric fever prior to the outbreak at Eagley occurred among the men engaged at the mill, but Mr. Sergeant in a report mentions the fact that there existed "abundant evidence that some individual who had used the stream had suffered from diarrhœa." That is, Mr. Sergeant points out, a very suspicious circumstance, for, as he says, the diarrhœa may have been of a typhoidal character, and the recent deposit of diarrhœal excrement may solve the difficulty concerning the suddenness of the outbreak.

There can, I think, be no doubt of the correctness of Mr. Sergeant's opinion that the co-existence in the Eagley dairy water of these large amounts of volatile matter, ammonia and chlorine, points to contamination of this water with animal organic matter of apparently excremental origin.

Finally, as to the extent to which the brook-water had access to the milk, no trustworthy information was obtainable; but it will be admitted that the absence of evidence on this head in no way invalidates the conclusion as to the causation of the outbreak through the operation of milk. It is enough to observe that the foul brook water was the only water used on the farm premises for dairy purposes. At other dairy farms in Eagley other water is in use, and at each farm one single water service for dairy use and for domestic purposes. The water at these other dairies is often bad water, but without the special opportunity had by this water of becoming abundantly contaminated with unchanged excrement.

It hardly appears needful to insist on the chief lesson taught by the foregoing history. The case is simply one more, and a serious one, added to those cases already on record which point to the urgent necessity for regulation and adequate supervision over the sanitary circumstances of dairy farms.—*Practitioner*, *Sept.* 1876, *p.* 225.

4.—ON THE USE OF BELLADONNA IN ENTERIC FEVER.

By Dr. JOHN HARLEY, Assistant Physician to St. Thomas' Hospital.

What advantages are to be expected from the use of belladonna in enteric fever? is the question which presents itself at the outset of this inquiry, and suggests the need of a proper

theory of the action of the drug. This primary question resolves itself into two others, viz. 1, the nature of enteric fever; and, 2, the special action of belladonna in the body. A brief consideration of these will therefore be a proper, if not an altogether necessary, introduction to the main subject.

As to the nature of enteric fever. It will be sufficient for our present purpose to regard it as a general enteritis, accompanied by sympathetic irritation of the lacteal glands and spleen, and commonly associated with more or less pulmonary inflammation —a condition of congestion of the internal viscera,—of dilated blood-vessels and retardation of the blood current amounting at certain points to actual stasis.

As to the action of belladonna. The effects of moderate and oft-repeated doses are as follow:—1, they have a hypnotic and sedative action on the brain and spinal cord respectively; and, 2, a powerful stimulant action on the sympathetic nervous system, as may be demonstrated by the following experiment: —A dog, susceptible of the hypnotic influence of opium, is narcotised by a sufficient dose of morphia for the space of three or four hours. The respiration and pulse, which have sunk to a uniform level as soon as narcotism supervened, will be maintained, the first at 14 to 16, and the latter from 65 to 75, a minute, the pulse manifesting a very regular respiratory undulation, rising to 75 towards the end of inspiration, and falling to 65 at the end of expiration. The pupils will be contracted to about $\frac{1}{7}$th. If now the fraction of a grain ($\frac{1}{60}$th) of atropia be admitted under the skin during any period of the narcotic stage, remarkable effects are rapidly developed. The finger which could previously feel the apex stroke of the heart with difficulty, now clearly distinguishes a growing excitement, which in the course of a few minutes becomes evident to the eye as well. A quarter of an hour after the injection, the pulse is nearly trebled in frequency. The cardiac excitement progressively increases, and at the end of three quarters of an hour the heart is seen vibrating against the chest-wall, beating regularly 300 times in the minute, being an acceleration of 234 beats for this brief period. This, the maximum acceleration, is sustained for a while, and the rate then slowly declines, but at the end of four hours the pulse is still accelerated some 24 beats beyond the initial rate. The pupils mean time are widely dilated. Further and in respect of the hypnotic influence of belladonna, the same effects result if the atropia be given at a time when the narcotism has passed off and the animal is readily awakened from sleep; but in addition to the stimulant effects on the sympathetic ganglia above described, the animal again lapses into a state of narcotism. Even when the dose of morphia is double, and that of atropia reduced to half, the

same effects are observed. Indeed, as I have shown, opium and belladonna both intensify and prolong each other's effects; and since opium as a means of checking excessive diarrhœa was in many of the cases a necessary adjunct to the belladonna treatment, it is proper that I should call attention to the combined operation of the two drugs. It will be understood, therefore, that the action of belladonna on the body is the same whether it be given alone or in combination with opium, but that in the latter case it is somewhat intensified.

Looking, therefore, to the effects of belladonna in dilating the pupils and exciting the heart, we conclude that the drug is a direct and powerful stimulant to the sympathetic nervous system.

Let us now inquire what are its effects on the blood-vessels. If we observe the small arteries and capillaries during the operation of moderate doses of belladonna, we shall find that they are maintained for hours in a tonic and slightly contracted condition. The blood is equally distributed, and the circulation in any given part is so tight and rapid, that it really contains a little less blood than when in a quiescent state, and the tissue is consequently a little paler, but the quantity that passes through it in a given time is greatly increased. It is to be expected that a drug which is capable of producing such intense excitement will, if given in excessive doses (and these will be still as to quantity very minute), produce exhaustion. This is actually the case; dilatation of the minute blood-vessels and stasis of the blood being the effects of improper doses. As these observations on the use of belladonna in enteric fever were made about seven years ago, and before belladonna juice was admitted into the Pharmacopœia, I may mention that the succus employed was prepared by Messrs. Jacob Bell & Co., in the manner and proportions since prescribed in the Pharmacopœia. The following were the effects of ℥xxx (a dose given to many of the patients whose cases are narrated below), as noted in six healthy adults, male and female. Belladonna action was fully developed in all within an hour, and completed as far as could be determined by any appreciable effects at the end of the second hour. The pulse in one was accelerated only 10 beats; in another, 20; in a third, 26; in two others, 40 beats; and in the sixth (a youth of twenty), the cardiac systoles were more than doubled, the pulse rising from 60 to 140 beats. No effect on the respiratory movements were observable in any. The individual in whom the acceleration of the pulse amounted to 80, did not throughout the 45 minutes during which this the maximum acceleration continued, manifest the slightest disturbance of the breathing. The respiration never exceeded 18; and at the time when the cardiac excitement first reached its

acme and afterwards the inspirations numbered 15 or 16, and were natural and easy.

When the patient is taking thirty minims of belladonna juice every four hours for days together, moderate or excessive symptoms (of which active delirium is the chief) are developed according to the age or idiosyncrasy of the patient; and it is never necessary to give this full dose oftener than every six hours. In some cases I have found it necessary to diminish the dose on account of talkative delirium which had evidently been induced by the belladonna; and, as a rule, I find that ℥xv of the succus given every four or six hours is quite sufficient to sustain that moderate atropism which is beneficial. When delirium has been present, I have never found this dose increase it, but rather the reverse.

In enteric as in scarlet fever, severe congestion of the kidneys, and attendant albuminuria are not uncommon events. For the prevention or relief of this condition belladonna is the appropriate remedy, for I have shown that the whole of the atropia admitted into the body is eliminated unchanged by the kidneys. If, therefore, the quantity of atropia be not excessive, it follows that an active circulation is maintained in these organs during the time they are engaged in its elimination.

[Dr. Harley relates 28 very interesting cases, and concludes by the following analysis:]

Analysis of the foregoing cases with reference to the degree of development of the particular symptoms, shows the following results:—1. As to the pyrexia. It appears that *the rate of the pulse and the degree of temperature* were never, as a rule, increased, but, on the contrary, both these symptoms uniformly declined under the use of belladonna. The daily averages of the pulse above given are, considering the severity of the cases, certainly low. My own impression is that the stimulant action of belladonna on the heart is converted in the pyrexial state into a tonic and, and if not pushed too far, even a sedative influence on the heart and blood vessels generally; in other words, that it is a tonic and sedative to the sympathetic nervous system generally. This I take to be the fundamental explanation of its effects in the febrile state. By this action the capillary circulation is accelerated, the contraction of the vessels promoted, and thus the arterial tension which attends congestion of the parenchymatous organs is relieved, and a load at once removed from the heart. Diminution of temperature is the direct consequences of these changes.

As the result of the prolonged use of belladonna after the cessation of the pyrexial stage, I have noted an irritable debility of the heart as if it had been exhausted by over-stimulation,

and the nervous system has also shown a participation in this effect. Thus, with reference to the heart, a young woman, æt. 18, for example, continued to take a moderate dose (mx) of belladonna juice every four hours for nine days after convalescence, and as she reclined on her bed in a state of rest, the pulse numbered 60 and the respiration 16. With the finger still on the pulse, and after three or four deep inspirations, it rose immediately to 88. In these cases there is generally a little hurry and excitement, and a liability to flushing when spoken to. These, the usual consequences of prolonged fever, are, I believe, exaggerated by the abuse of belladonna. When take in conjunction with the fact stated in the outset, it appears that the beneficial use of belladonna lies with narrow limits as to dosage, and that vigilance must be exercised lest these limits be exceeded.

As to *delirium*. Except in a very small proportion of cases, I have not observed that this symptom in enteric fever is increased by belladonna, and I have never withheld the drug on account of delirium. In the three or four cases referred to, I have not always been sure that the delirium and belladonna have stood to each other in the relation of effect and cause. Speaking generally, the effect of the belladonna was to diminish the insomnia so frequently present, and it may therefore be said to have a slight hypnotic and calming effect on the cerebro-spinal system.

As to the condition of the *tongue and skin*. One of the most noticeable effects of belladonna in the pyrexial condition is moistening of the tongue. In many of the cases above recorded the patient had been admitted with a dry, parched tongue, and it has become soft and moist after a few doses of belladonna, and has remained so during the further progress of the disease, notwithstanding, in many cases, an increase in the severity of the general symptoms. No particular effect on the skin was noted, but those critical sweats, attended as they commonly are in this disease by a copious eruption of sudamina, occurred as frequently and abundantly as when no belladonna was given.

As to the *alvine discharges*. As far as I could determine, the diarrhœa was not directly influenced either way; but in those cases in which the belladonna was given from an early stage of the disease, it appeared to me to be of shorter duration. The tendency to hemorrhage in like manner appeared to be uninfluenced—directly at least. It happened in 12, or about 5½ per cent. of the cases treated. The point to which I particularly directed my attention was the reappearance of bile in the stools, and I have a decided impression that the liver was restored to a healthy action at an earlier date in the belladonna cases than in those treated by ordinary remedies (such as chalk, catechu,

dilute sulphuric acid, and opium). This was indicated by the yellowish-brown colour of the fæces, and sometimes by bilious vomiting about the third week of the disease; and in many cases by an early cessation of the diarrhœa and the formation of solid, normal-coloured fæces.

Passing from these particular indications, I will now give the general results as indicated by the proportionate mortality.

The total number of patients treated with belladonna during the whole or only a portion of their illness was 228, of whom one half were females.

The average age was 18 for both sexes, and the average duration of residence in the hospital about 37 days.

Of the total numbers 28 died, *i.e.* 1 in every 8·14, or 12·28 per cent.—a low rate of mortality, but susceptible of being placed in a more favorable light still, as the following facts will show. The belladonna treatment was soon applied indiscriminately, and only withheld when the increase of delirium, urgent pulmonary symptoms, hemorrhage, or perforation rendered the use of other remedies imperative. Belladonna was therefore given to a number of patients admitted in the third, fourth, or even fifth week of their disease, and of some of whom it may truly be said that they were brought into the hospital to die. This will appear from the following brief summary of some of the fatal cases included in the mortality estimate given above.

1. Martha H., æt. 21, was ill a month before admission, and died ten days afterwards. The lower end of the ileum was loaded with thick-margined congested ulcers. The right lung was bound down by old adhesions, and the upper lobe as well as the lower lobe of the left lung spleenified.

2. Catherine M. had almost completely recovered from the intestinal lesion, the fæces being normal, and all but one or two ulcers healed, when she sank of sheer inanition.

3. Charity G. In this case general tuberculosis was undoubtedly fully developed before she was admitted into the hospital, of which she was an inmate only eleven days.

4. Rachel S., æt. 12, was admitted at a late period of the disease in a typhous state, with sordes on the teeth and a pulse of 140. She took belladonna only two days, and died five days afterwards.

5. Mary J., æt. 23, was also admitted at a late period of the disease in a typhous condition, with sordes and active delirium. She took belladonna two days only, and died five days after admission.

6. Elizabeth D., æt. 16, was also admitted in a typhous condition, and with sloughing of the labia pudendi. She took belladonna only two days, and died on the tenth day of her sojourn in the hospital.

7. John C., æt. 14, was admitted in the fourth week of his illness, delirious, and with a pulse of 130. He died seven days afterwards of perforation, which appeared to have occurred before admission, for there was no indication of any fresh abdominal lesion afterwards.

8. James B., æt. 19, was admitted at the end of the fourth week of his illness. He took belladonna only four days, and died on the fifth day after admission. The lower lobes of both lungs were in the stage of red hepatisation; angry, bleeding ulcers still occupied the sites of the lower Peyer's patches.

9. Leonard D., æt. 10, was admitted in a prostrate condition in a late stage of the disease, and died after forty-eight hours, when it was found that the pericardium was wholly adherent (old adhesions), the valves of the left heart had been the seat of previous rheumatic endocarditis, and the ulcers of the ileum were nearly healed.

How far these cases should be excluded in calculating the death-rate and in determining the remedial influence of belladonna in enteric fever, or rather that concurrence of pulmonary and enteric inflammation, which I have elsewhere termed pneumonenteritis, I will leave the reader to determine. I have felt it proper to bring forward every case in which belladonna was given, but it will at once be conceded that Cases 4, 5, 6, and 9 just specified should be excluded. This would reduce the death-rate to 1 in 9·3, or 10·71 per cent.—a most satisfactory result.

Six of the whole number died of perforation of the ileum. Pneumonia was the immediate cause of death in a considerable proportion of the remainder.

The belladonna treatment was continuously pursued throughout two years, viz. from November, 1869, to November, 1871; and during this period I find that 131 other cases of enteric fever in my practice were treated in the usual way. From this it might be inferred that a selection was made of the cases as to the particular treatment to be adopted, but this was not so, but the variation was determined by several causes; thus, in a number of cases enteric symptoms were undeveloped for some time, during which the nature of the case was somewhat doubtful, and in these cases the treatment first adopted was continued; or a sudden outbreak of diarrhœa or hemorrhage called for astringent remedies. At one time the supply of belladonna was exhausted and not immediately renewed. At another time a temporary change in the resident medical officers in charge of my patients led to the adoption of the ordinary treatment, which I was glad to continue, in order that I might have a number of concurrent cases with which I could compare those treated by belladonna.

These cases, 131 in all, that is rather more than half the number of the belladonna cases, afford the following statistics:—20 or 1 in 6·5 died, thus giving a death-rate of 15·26. But 3 of these died within twenty-four hours of their admission into the hospital, thus reducing the mortality to 13·28. This is a low rate as compared with that of the whole number of patients suffering from enteric fever admitted into the London Fever Hospital during a period of twelve years (from 1848 to 1859). The mortality for this period was 17·26, and after deducting the deaths which took place within forty-eight hours after admission, 15·82.

The question suggested by my own figures is, whether the diminished rate of mortality in the cases under ordinary treatment should be attributed to the use of belladonna in the greater proportion of the whole number of cases?

This is a question which must be decided by a further experience of the drug. I think I have adduced sufficient evidence to show that the use of belladonna in enteric fever has been so far attended with good results; and that the theory of its action, which I have propounded at the outset, has been borne out in practice.—*St. Thomas's Hosp. Reports*, 1875, *p.* 199.

5.—ON THE VALUE OF ALCOHOL AS A FOOD, AND ON ITS FEBRIFUGE ACTION.

By Dr. C. Binz, Professor at the University of Bonn.

[The observations of Dr. Binz are peculiarly valuable upon this subject, as they are based upon his own experimental researches.]

We must regard as a food any substance which, when taken into the system, can serve (1) towards building up the tissues, or (2) towards supplying the warmth and vital force necessary for the proper performance of the various functions of the body.

As the list of positive examples is so extensive, these points can better be illustrated by reference to certain negative ones. Thein, for instance, is not a food, as it passes through the system without undergoing decomposition; nor is ether a food, since it cannot be taken in quantities sufficiently large to contribute by its oxidation any appreciable weight, warmth, or vital energy* to the body. Gum arabic is not a food, because it is not absorbed in the intestinal canal.

Alcohol fails, perhaps, to fulfil the first office of a food according to the foregoing definition, since it is incapable, as

* Ether, it is true, acts as a cardiac stimulant, but as such it contributes no new force to the heart; all it does being to excite the heart so as to make it put forth what force it already has more energetically. In other words, instead of contributing fresh power, it drains away more rapidly that which is left.

far as we know, of supplying material to build up the tissues, but when given in small doses, oft repeated, especially in the case of a sick person, it may be said to surpass all other substances as a species of easily burning fuel, from whose combustion the heat required to generate vital force may be derived. Indirectly, it also answers the first of the aforesaid purposes, for though it may furnish actually no new building material, it spares the reserve supply of fat in the body, which would otherwise have to be burned to give the necessary warmth. In sickness, where but little or no fatty material is supplied by the food, this is of course conservative, but in health no need is felt for a specially combustible form of fuel, and so we see how many persons in good health, under the combined influences of good living, alcohol and bodily inactivity, grow very fat, the alcohol supplying a good deal of the heat required by the system, and some unburned fat continuing to be stored away year after year.

I have convinced myself by a series of experiments that alcohol is completely destroyed in the animal organism. If pure it leaves no taint upon the breath, and where this is present it is attributable to some of the ethers or fusel oil. Thus, in the experiments referred to, I found only traces. I used three different methods: the chromic acid and the iodoform test, and Geissler's Vaporimeter. Their correctness was always controlled by known dilutions in water containing most minute fractions of alcohol. The urine may, under very favourable circumstances, contain as much as three per cent. of all the alcohol consumed. This is the highest figure I have been able to get. Aldehyde and acetic acid, the derivatives of alcohol, were absent. The facts observed all seem to lead to the conclusion that alcohol in the body, just as in the flame of the spirit-lamp, is oxidised to carbonic acid and water.

Such being the case, it is evident that every molecule of alcohol burned within the system must yield, not only warmth, but that power to accomplish work with which the development of caloric is always accompanied. Let us see how much.

From direct experiments made by Favre and Silbermann, and by Frankland in England, with a view to ascertain the relative heating power possessed by various combustible substances, gases, &c., it was found that alcohol gave the figure 7; pure coal gave 8, and hydrogen 34·5; which is to be understood as meaning, that one cubic centimeter of alcohol generates heat enough during its combustion to raise the temperature of seven litres of water 1° Cent., that one cubic centimeter of coal suffices to rouse eight litres 1' Cent., and so on. The unit of the scale thus arbitrarily set up is represented by the amount of heat required to raise the temperature of *one* litre of water 1° Cent.,

and to this unit the name *Calorie* has been applied. A healthy adult produces about 2,300 such *calories* a day. Now, in the process of consuming 100 cubic centimeters of absolute alcohol, equal to one litre of good hock, we set free within our organism 700 *calories*, or nearly one-third of the whole amount of warmth which is produced by the system under mixed diet within twenty-four hours.

With this result given by alcohol, let us now compare the heat-producing power of certain other ingesta as determined by Frankland: for instance, cod-liver oil, a substance which may be taken here as a type of the fatty elements of food in general, being one of the most digestible. Its calorific power is represented by the figure 9·1. Four table-spoonfuls taken four times a day—about 50 cubic centimeters—develop 455 *calories*, supposing the whole quantity to be digested, and this, it will be seen, is only about ⅐ths of what 100 grammes of alcohol supply, or in other words, not more than would be furnished by 65 grammes of alcohol.

The advantage possessed by the latter over the oil is obvious. Besides being infinitely more pleasant to take, the alcohol, if largely diluted with water, in the form of good wine, is readily digested, even in the weakest stomach; and, as has been shown, it is easily and completely disintegrated in its passage through the system. On the other hand, all fatty substances require for their emulsion, absorption, and assimilation, a very considerable amount of work, which of course is only that much more drain upon the powers of a patient.

Thus we can understand how it is that a continual supply of wine enables the patient to resist for a certain length of time the ravages of a severe disease, where no other form of nourishment is accepted by his stomach. Every practising physician who recognises the value of wine in therapeutics will be able to call to mind cases of typhoid fever, where for several days nothing was taken but wine and water, the patient retaining his strength pretty well all the while. Bricheteau, a French surgeon, relates the case of a boy affected with diphtheria, upon whom the operation of tracheotomy was performed, and who for a month afterwards would take nothing but sweet wine, of which he consumed one-and-a-half bottles daily, besides two ounces of rum, and who during the whole time did extremely well. In this case the sugar of the wine of course contributed something as a food to the whole effect, but being present in the sweetest wine only in small proportion, it could have accomplished only very little.

In such cases it would be unreasonable to suppose that the vital powers of the patient are kept up solely by the stimulating properties of the alcohol, for the nervous system and heart

require nourishment as well as any of our other organs, and they cannot be kept going so long by stimulants alone. On the contrary, by so urging them on to activity day after day, without supplying any food to compensate for the wear and tear resulting from such augmented action, it is certain that we would exhaust their forces more quickly than by any other plan of proceeding. Alcohol certainly acts as a stimulant in conditions of extreme weakness, but given for days together when no other combustible material is being supplied to the system, it burns in the tissues, and by means of the heat thus generated, furnishes the body with warmth and the strength necessary to carry on its vegetative functions.

I would especially call attention to the success with which dilute alcohol in frequent doses, in the form of Kumyss, and in a similar manner of other light alcoholic beverages, has been applied for several years past in the treatment of the earlier stages of pulmonary tuberculosis; first in Görbersdorf (Silesia) and subsequently in Davos (Switzerland). If a form of nourishment that fattens,—this and nothing further can be claimed for cod-liver oil,—is a dietetic desideratum of primary importance in combating the commencement of tuberculosis, then the free use of light wines belongs to the treatment, for experience at the two places above mentioned shows that, as a rule, patients fatten upon the plan of treatment there pursued, without suffering from any febrile effervescence or injurious excitement attributable to the abundant use of wine.

And even in the more advanced stages of consumption, a relatively favourable influence from the alcohol treatment can be expected, as was strikingly shown by experiments made on my request in the Bonn military hospital two years ago.

To my surprise, a meritorious author has lately expressed quite a contrary opinion.

"Through every stage, except the first, the special action of alcohol is to reduce the animal temperature. In fact, cold and alcohol act in the same manner on the vital processes . . . . the amount of carbonic acid is decreased. From all these facts the inference is that alcohol is not burned after the manner of a food which supports animal combustion, but that it is decomposed into secondary products, by oxidation, at the expense of the oxygen which ought to be applied to the natural heating of the body."

It seems to me that the inference so drawn, however plausible in theory, is overborne by the following facts elicited from experiments. First, that after *small* doses of alcohol, neither the temperature of the blood nor the quantity of urea in process of being thrown off is found to be measurably diminished; secondly, that even such quantities as lowered the temperature

of the blood at first, cease to produce this effect after having been repeated a few times; thirdly, that when there is no impediment to the respiration, the organism obtains much more oxygen than it can consume; and fourthly, that no "secondary" product of alcohol has been found as yet in the organism.

A litre or a half-litre of good hock, taken all in a short time, will produce in a decided manner the results already described as belonging to the action of powerful doses of alcohol; but if given to an adult—even to a "teetotaller"—in broken doses distributed equally along through the whole twenty-four hours, it will not affect the temperature of the body during that time to any measurable extent. In the latter instance it will simply burn, as would any other innocent and digestible hydro-carbon, giving off its proper quantum of heat to the tissues, and resolving itself into carbonic acid and water. A similar proceeding, if repeated the next day, will simply give the same results.

Where we have to deal with a patient whose stomach will accept nothing else, and whose absorbent glands will assimilate no other form of nourishment, the nervous system and the heart derive from the alcohol of that bottle of hock or claret a good part of the energy which they exhibit in the continued performance of their functions, for as this alcohol burns, the heat evolved by its combustion *must be* converted into working force.

Alcohol is not the only medicinal agent which produces entirely different effects according to the manner of its administration. In support of this assertion I need only refer to calomel, and to the enormous difference of action it exerts according as it is given in small doses oft-repeated, or in single large ones.

One of the most difficult points for the practitioner is to procure a form of alcoholic beverage that is quite free from fusel oil. If, for instance, we take two similar animals and intoxicate one of them with an alcohol which has been previously purified by treatment with wood charcoal just recently made glowing—(such charcoal takes up all the fusel oil)—while the other is made drunk with alcohol to which a few drops of amyl-alcohol have been added, a decided difference of effect will be observed. The latter animal lies completely stupefied, while the former still runs about; the one recovers from its condition of narcosis but slowly and with difficulty,—the other rapidly. If the doses administered have been large, a paralysis of the respiratory centre may readily supervene in the case of the animal to which the impure alcohol was given, while the other, with a like quantity of pure ethyl-alcohol, continues in the enjoyment of life.

There can be no question that the human organism is affected by the fusel oils in quite the same manner. This is clearly observable in districts where potato-spirit is drunk. Such potato-spirit contains a relatively large proportion of fusel oil, and in the districts referred to drunkenness commonly assumes the most desperate character. One sees the same thing in a less degree in connection with the consumption of wines which have been "*doctored*" with alcohol obtained from potatoes. These wines very quickly produce a heavy intoxication, the disagreeable after-effects of which are remarkably protracted, whereas pure wines, such as only the grape furnishes, even in intoxicating quantities leave behind, as a rule, neither headache nor any undue fulness of the cerebral vessels.

Now, if we introduce into the system of a sick man any alcoholic mixture in which fusel oil is contained, the evil effects produced by the latter upon the brain, in this case already weakened by disease, will manifest themselves yet more strongly than they would upon a healthy one; and just here lies the great practical difficulty, the "hidden reef," so to speak, for the therapeutic use of alcohol. After all the different calamities that have befallen the vine upon the Continent, the quantity of impure alcoholic drinks at present in circulation is necessarily very large, thus making it particularly difficult nowadays to find a pure article. How then is the physician to meet this difficulty?

There are two ways open. First, he may employ in his practice only the pure spirit of wine, from which, largely diluted with water, he causes to be prepared a palatable drink, containing in addition sugar and some innocent aromatic substance. To test, however, whether the spirit of wine itself is quite free from fusel oil, it is only necessary to rub a few drops of it between the palms of the hands, thus causing rapid evaporation, after which, by means of the sense of smell, one can decide the question. Pure alcohol evaporates very quickly, leaving behind no smell whatever, while that which is impure leaves upon the hand a distinct odour of fusel oil, which consists principally of amyl-alcohol.

A second plan is as follows. Let the physician make exclusive use of some *one* form of alcoholic preparation which he has found from repeated experience to be reliable; this the patients are to procure always from the same source, best of course from some large and respectable establishment. Then it is further very desirable that specimens of this special preparation should be examined from time to time in order to determine that its ‘age of alcohol remains the same. This can be done in a ‘utes by means of the Vaporimeter of Geissler, even by ‘o are inexperienced in chemical manipulations. In the

following table I give the percentage of absolute alcohol contained in some of the different well-known spirituous drinks.

Volume per cent. of absolute alcohol contained in Bavarian beer is	4—5
In the different kinds of hock and claret	8—11
In the sweet Spanish and Italian wines	13—17
In brandy, gin, whisky, &c.	30—50

To produce an antipyretic effect an adult will require a dose of not less than 50 cubic centimeters, or about two fluid ounces of absolute alcohol.

By reference to this standard, the dose suitable for each individual case can be easily reckoned out, according to the age and strength of the patient.

Finally, to sum up my views, as far as the same concern the practice of medicine, I may say (1), that alcohol is very frequently a stimulant of transitory power; (2), that in relatively large doses it can serve as a vigorous antipyretic; (3), alcohol, given in small and oft-repeated doses, is a food particularly adapted to cases where the stomach can take in no other "combustible material" to supply warmth and working energy to the organism.

While I thus share in the views which the late Dr. Anstie so ably upheld in England, I do not hesitate, on the other hand, to declare, with respect to the requirements of the healthy organism, that I consider the use of alcohol in health as entirely superfluous.

Where the digestion is healthy, and where a sufficient transfer of nutritive material takes place from the food to the blood, the human body is capable of accomplishing all the functions for which it is designed, and that without the use of spirituous drinks. But the case assumes a different aspect as soon as these two conditions fail. A physician may therefore recommend total abstinence to healthy persons in every instance, but he throws away one of the most valuable of medicines if he carries this principle of *teetotalism* into the sick-room.—*Practitioner, May* 1876, *p.* 359.

6.—SALICYLIC ACID IN RHEUMATISM.

By Dr. HALL CURTIS, Boston, U.S.A.

The following *résumé* gives the result of the treatment of fourteen cases of acute rheumatism by salicylic acid, in the Boston City Hospital, as reported by Dr. Hall Curtis, in the Boston Med. and Surg. Journal.—*Case* 1. No effect from salicylic acid. 2. Alkalies for a month; then acid, eight doses, with relief. 3. Alkalies for twenty days without relief; acid in one day gave relief. 4. Acid for seven days; patient well. 5.

Alkalies two days; acid seven days with entire relief. 6. Relief after four doses of acid; this was continued four days; recovery. 7. Acid three days without relief, followed by tincture of chloride of iron for fifteen days; recovery. 8. Alkalies gave relief in four days; recurrence. Acid given four days with entire relief. 9. Acid three days; no relief; alkalies for twelve days; recovery. 10. Acid seven days with entire relief. 11. Acid refused by stomach; alkalies during eleven days with relief. 12. Acid for nine days; complete relief after the first four days. 13. Acid five days with relief; discharged, well, in seven days. 14. Acid seven days; complete relief in three days. The acid was generally given in wafers, in ten-grain doses every hour while the patients were awake. The cases are given rather briefly, and the total amount of salicylic acid given is only stated in one case (No. 1), and in this instance the acid was omitted after five ten-grain doses. In case 9 the acid was only given in ten-grain doses ter die. Another case of recurrent acute rheumatism, cured after the ninth dose of seven grains every two or three hours, is reported in the same number.—*Dublin Journal of Medical Science, June* 1875, *p.* 585.

7.—ADMINISTRATION OF SALICYLIC ACID.

M. A. Casson proposes (*Bull. Gen. de Thérap.*, April 30) the employment of citrate of ammonia as a means of facilitating the solution of salicylic acid. Half a drachm of salicylic acid dissolves readily in less than four ounces of water (120 grammes), if 37 or 45 grains of citrate of ammonia are added. M. Casson gives the following formula:—For a solution—salicylic acid, ʒi; citrate of ammonia, ʒss; rum or brandy, ℥i; distilled water, ℥v. A tablespoonful of this solution will contain from 4 to 4½ grains of salicylic acid. The citrate of ammonia is easily prepared by saturating ammonia in a solution of citric acid.—*Dublin Journal of Medical Science, June* 1876, *p.* 586.

9.—TREATMENT OF ACUTE RHEUMATISM BY SALICINE.

By Dr. G. T. Schofield, Mossley, Manchester.

After reading Dr. Maclagan's first report on his treatment of rheumatic fever by salicine, I resolved to give it a trial, and have used it since with increased confidence in its efficacy. I have treated thirteen typical cases from the beginning of March up to the present time with this new remedy, and have found in almost every instance very rapid abatement of the symptoms and quick recovery from the disease. As a considerable number of cases have already been published in the Journal, I enclose [illegible] only, taken haphazard from the thirteen.

Case 1.—Jas. W., aged 33, was attacked on March 30 with pain and swelling in all the joints of the lower extremities, left wrist, and right shoulder. He had great thirst, dry [illegible] sweating, &c. I ordered a saline mixture, and six [illegible] compound ipecacuanha powder every four hours. On [illegible] 31st, the temperature was 103 deg.; pulse, 98; respirations [illegible] There was no abatement of pain. I ordered salicine in [illegible] five-grain doses every three hours; to discontinue [illegible] and Dover's powder.—April 1st. Temperature 102 [illegible] pain was considerably less in the shoulder. He was [illegible] move his arm freely. The left knee and ankle were [illegible] better.—April 2nd. Temperature 101.5 deg.; pulse 96; respirations 24. He had a very good night. The pain was entirely from the shoulder, left wrist, and left leg. The effusion into the joints was scarcely perceptible. He was ordered to continue the salicine.—April 4th. Temperature 101 deg.; he complained of great pain in the right elbow (which was inflamed), but none elsewhere. He slept well. There was little perspiration. His appetite was moderate; bowels confined. He was ordered an ounce of castor oil.—April 5th. Temperature, pulse, and respiration were normal. He was free from pain; felt stiff in the limbs, but was able to get up. From this date, he made a good recovery, and was allowed to work on the 17th.

Case 2.—This patient, aged 23, had suffered from rheumatic fever twice previously. On the evening of March 28th, he was called to see him, and found him suffering from all the symptoms of the fever, with intense pain over the cardiac region, extending as far as two inches to the right of the sternum. There was a very distinct endocardial murmur. There was swelling in the joints, but the pain was so great that he could not bear the weight of the bedclothes. Temperature 104 deg.; pulse 120; respirations 32. I ordered thirty grains of salicine every three hours, and a saline aperient; turpentine stupes over the chest; and the joints to be wrapped in cotton-wool.—March 29th. Temperature 103 deg.; pulse 110; respirations 26. He said the pain over the chest was much better. The murmur was not so loud as on the previous day. There was improvement in the limbs. He was ordered to continue the salicine, and to have one ounce of castor-oil.—March 30th. Temperature 101.5 deg.; pulse 104; respirations 21. The patient expressed himself as considerably better to-day, being free from pain over the chest. On examination, I found considerable effusion into the left knee and ankle and right ankle. The endocardial murmur could be heard, but not so distinctly as before. As he complained of insomnia, on the previous night I ordered a quarter of a grain of morphia at bedtime.—March

31st. He had a good night. The pain was quite gone, except in the wrists and right shoulder. He expressed himself as much better. Temperature 100 deg.; pulse 96; respirations 20. From this date up to April 5th, he went on gradually improving. On that day, he had a slight relapse, with return of the cardiac symptoms. I again put him on the salicine treatment (thirty grains every four hours) for three days. At the end of that time, he declared himself quite well, and went to his employment.

Salicine may be taken in water or any convenient fluid, but I have found my patients take it most readily in a small quantity of milk. I have given it in doses ranging from fifteen to thirty grains, according to the age of the patient and the severity of the symptoms; and think with Dr. Maclagan that, if given in full doses immediately on the manifestation of the disease, it has the power of cutting short the attack sooner than any other drug with which we are at present acquainted. I have given it persistently four weeks in a case of chronic rheumatism of six years' standing, but without any beneficial result.—*British Med. Journal, June* 3, 1876, *p.* 688.

9.—CASE OF RHEUMATIC FEVER TREATED BY SALICINE.

By Dr. HUGH B. BREW, Surgeon to the Wicklow County Gaol.

Miss O. R., a strong healthy girl, aged 15, came under my care on May 3rd, suffering from rheumatic fever. She had been ill for four days, but had not been seen by any medical man. On May 3rd, she had high fever; pulse 120; temperature 105 deg. The tongue was moist and furred. The knees and ankles were painful and swollen; the right foot and ankle cold and livid. I prescribed bicarbonate of potass in ten-grain doses every third hour, and a linseed-meal poultice to the right knee and foot; the nourishment to consist of beef-tea and milk. On May 5th, the bowels had been moved four times during the night. She did not sleep, and was very thirsty. The pain had moved to the wrist and knuckles. Morning temperature 105 deg; pulse 126; evening temperature 105.6 deg. I discontinued the bicarbonate of potass, and ordered chalk mixture and catechu, and the joints to be enveloped in cotton-wool. On May 6th, she was very delirious during the night. The bowels had been moved six times. The urine was scanty; I did not see any of it. Owing to her helplessness and pain, she would not use the bed-pan. Temperature, morning 105 deg.; evening 105.3 deg.; pulse 120, very weak. This day I had the advantage of a consultation with my friend Dr. McClelland, of

Newtown-Mount-Kennedy. The pain was principally in the back and hips. The heart-sounds were normal.—May 7th. She had a very restless night. The bowels were moved several times. She had perspired freely since the commencement of her illness, The tongue was furred and moist; the knees were swollen and very painful. She could not bear the weight of the bedclothes. Pulse 120; temperature, morning 105.2 deg.; evening 105.2 deg.

From the favourable mention made of salicylic acid and salicine in the treatment of rheumatic fever in the British Medical Journal of May 6th, I determined to give salicine a trial (not being able to procure the acid at the time), and ordered twelve grains every third hour, discontinuing all other medicine. On May 8th, she had a better night. The pain had moved to the shoulders and back of the neck. The bowels were moved only once. Pulse 110, and strong; temperature, morning, 103 deg. (a fall of 2.2 deg). She said she felt better, and thought the powders had done her good. Temperature, evening, 103 deg. The urine was scanty and acid, of specific gravity 120. Her nourishment was milk and arrowroot. The salicine was increased to fifteen grains every third hour. On May 9th, she had had a good night. The pain was much relieved, and was confined to the shoulders and elbows. She said the powders always relieved the pain. Pulse 100; morning temperature 102.5 deg.; evening 102.3 deg. On May 10th, she had slept a good deal last night. The pain was almost gone. The bowels were regular. She was not nearly so thirsty. Temperature, morning, 102 deg.; pulse 100; temperature, evening, 102 deg. She took nourishment well. On May 11th, she had a good night. The joints were swollen and tender, but the pain was quite gone. The urine was copious and very acid. On May 12th, she had slept well last night. She perspired profusely, and was much better. The back of the neck was painful; otherwise she was free from pain. She still took fifteen grains of salicine every third hour. Temperature, morning, 101.5 deg.; evening 101 deg.; pulse 100. On May 13th, she had had no pain since the last visit. Temperature, morning, 101 deg.; pulse 98; temperature, evening, 101 deg. On May 14th she slept all the previous night, and said she felt nearly well. There was no pain in any part of the body. Temperature, morning, 100 deg.; evening 100.3; pulse 90. On May 15th, she slept well. The joints were still covered with cotton-wool. The tongue was moist and cleaning. She still took the salicine every third hour. Temperature, morning 100 deg., evening 99.8 deg.; pulse 90. For the succeeding four days, the temperature averaged 99 deg.; pulse 84. There was no pain in any part of the body. On May 20th, she was convalescent. Temper-

ature 98; pulse 80; appetite good. She said she felt perfectly well. She still took the salicine every third hour. As my patient lived a considerable distance from me, I had an opportunity of seeing her but once each day. However, her temperature was carefully taken every fourth hour by her mother. In conclusion, I may say the improvement was most marked in my patient from the commencement of the salicine treatment. Diarrhœa, which was troublesome, was at once checked; and the pain in the joints, from being excruciating, became very trifling.—*British Medical Journal, June* 3, 1876, *p.* 687.

10.—THE TREATMENT OF RHEUMATISM BY SALICIN AND SALICYLIC ACID.

By Dr. T. MACLAGAN, Dundee.

The usual impression is that salicylic acid is preferable to salicin, and that the beneficial action of the latter is due to its being converted into the former in the blood. That is, perhaps, a natural conclusion for those who have been using salicylic acid; but it is almost certainly erroneous. More probable it is that both are split up into some other substance which is the true remedial agency. A more accurate view of Senator's position would have been conveyed if it had been stated that he expresses a preference for salicin, though he does lean to the view that it is converted into salicylic acid in the blood.

But all this is mere hypothesis, and is of little importance, as compared with the question, Which is the better remedy, salicin or salicylic acid? That each exercises a marvellous influence in cutting short an attack of acute rheumatism there can be no doubt. I have used salicin or salicylic acid in every case of acute rheumatism which has come under my care since November, 1874 (a year and a half), and invariably with the same result—a rapid cure of the disease. Seeing a patient suffering from acute rheumatism, I have no hesitation in assuring him that within forty-eight hours, possibly within twenty-four, he will be free from pain. That is a very different tale from any that can be told in connection with any other remedy.

Salicin is the remedy which I used first, but I have not confined myself to it. When salicylic acid was first recommended as a febrifuge, I determined to give it a trial in acute rheumatism. In the first case in which I used it, ten grains were ordered every two hours. On seeing the patient after four doses had been taken, the general condition was a little better, but she complained much of the medicine "burning her throat." I urged her to continue it. This she did, and on the following morning the pain was less, and the temperature had

fallen from 102·3 to 100·1; but to the burning sensation in the throat was now added sickness. I omitted the salicylic acid, and gave the same dose of salicin, ten grains every two hours. The sickness ceased; the burning sensation in the throat disappeared; and by the following day the pain was entirely gone from the joints, and the temperature had fallen to 98·8. She made a good recovery.

This case well exemplifies what is the chief objection to salicylic acid—its tendency to produce irritation of the throat and stomach. I may have been unfortunate in my experience, but in every case in which I have given it this irritation has been complained of. All writers on the subject agree in referring to this irritation as one of its unpleasant effects. The salicylicate of soda seems to give rise to the same disagreeable symptom. Salicin, on the other hand, never gives rise to any unpleasant effects. I have prescribed it within the last year and a half in many different ailments, in doses ranging from five to thirty grains. I am probably within the mark when I say that I have thus given it to at least a hundred different people; and I cannot recall a single instance in which any disagreeable effect was produced.

I have myself taken (by way of experiment) three doses of sixty grains—one in the forenoon, one in the afternoon, and one at night—without experiencing the least discomfort; but the smallest pinch of salicylic acid produces in me a feeling of heat and irritation in the throat, while a dose of ten grains gives rise to gastric irritation and a most unpleasant burning sensation in the fauces.

Salicin is a pleasant bitter, and is best given mixed with a little water, flavoured with syrup of orange if desired. In adequate dose—say fifteen grains every two hours—it cuts short an attack of rheumatic fever, without producing disagreeable effects. It should be continued in smaller doses during the first fortnight of convalescence.

As remedial agencies in acute rheumatism, salicin and salicylic acid seem to be equally efficacious; but the former has the advantage of producing no unpleasant effects. In time, too, it is sure to be much cheaper: a matter of some importance with a large class of sufferers from rheumatism.—*British Med. Journal*, *May* 20, 1876, *p.* 627.

11.—ON SALICYLIC ACID.

By Dr. J. C. Ogilvie Will, Assistant-Surgeon to the Aberdeen Royal Infirmary.

It is unnecessary to enter into the experiments which have been practised to prove that salicylic acid is a reliable anti-

septic, as that is now a matter beyond dispute; but its superiority to other antiseptics is, to say the least, at any rate so far as this country is concerned, still *sub judice*, and it is to the elucidation of this point that I at present propose to devote my remarks. The questions I shall endeavour to answer are—Wherein does the superiority of salicylic acid over other antiseptics lie? and where should it be employed? The main advantages claimed for salicylic acid, in addition to its powerful antiseptic effects—which, as I have just said, I take for granted—are its non-irritant quality, its non-volatility, and its freedom from odour. Among its lesser advantages may be classed its non-poisonous nature and the readiness with which it can be incorporated with fatty substances in the preparation of ointments. Carbolic acid is a powerful irritant, and even when used in a very dilute form it still gives rise to such a degree of irritation as to prevent epidermic formation. The irritant character of carbolic acid is universally allowed, even by its most ardent supporters, for the talented leader of the antiseptic school—Professor Lister—speaks of antiseptic suppuration, and for the purpose of preventing its occurrence he interposes a layer of prepared oiled silk—the protective as it is called—between his carbolic dressings and the wound, to preserve the wounded part from direct contact with the acid. With salicylic acid no such precautions are requisite, and that for a twofold reason, viz., that on account of its extreme antiseptic powers only a very small proportion of the acid is required, and that even when a strong preparation is employed the irritation is so slight as to be hardly worth consideration. This I have proved, not once, but very many times, and the conclusions I have myself arrived at are in perfect accord with those of Thiersch and Kolbe, who have had great experience of the effects of this antiseptic. Carbolic acid then being a most unsuitable application for a sore or wound when cicatrising action is required—some other must be sought for. Sulphate of zinc in the form of red lotion, boracic acid, and chloral hydrate all answer fairly well, and in many cases leave nothing further to be desired; but I am firmly persuaded that salicylic acid is at once both the most generally useful and productive of more favourable results than all the others put together, for under its influence the granulations become small and pointed, the discharge lessened and non-irritant, and the formation of epithelium takes place with amazing rapidity. During the past few months I have had some very striking examples of this in my wards in the Aberdeen Hospital, in cases of injury, where, as I have often pointed out to those who accompanied me during my visit, a few years ago, before the antiseptic era commenced, it would have been thought extremely bad surgery to

endeavour to save the limbs, and instead of attempting to do so, immediate amputation would have been considered the correct rule of practice. In the cases referred to I simply removed such parts as were absolutely dead, and made no attempt to form flaps, the wounds being left to heal by granulation. In several cases the ends of the bones were left uncovered, without the slightest untoward result, for granulations in sufficient quantity speedily sprang up from the surrounding soft parts, and useful and seemly hands resulted—for it was especially in machinery accidents in which the hand had been involved that I had recourse to this form of extreme conservative surgery. The importance of the least sacrifice of parts cannot possibly be exaggerated, when we remember that each inch of tissue left represents to the working man a certain sum of money, and this principle should ever be kept in view when dealing (surgically) with those who depend on the work of their hands for their daily bread. Some of the cases looked exceedingly unpromising for the first few days, and when I first adopted this line of practice I at times feared I had risked too much; but in no case had I ultimately reason for regret, as the results were invariably satisfactory. Salicylic acid, however, cannot of itself be credited with the successful results obtained, for carbolic acid played no small part during the course of treatment, and the comparative disuse of poultices, "the very name of which," to use the late Mr. Liston's expression, "is associated with putrefaction and nastiness," contributed not a little.

The successful issue in cases of lacerated wounds, or other open sores, does not depend on the employment of any one antiseptic throughout, but on the judicious selection of a certain substance at the proper period—at least such is my experience; and the practice I now almost invariably follow is to use an oily liniment of carbolic acid so long as marked sloughing goes on, and after the wound has become so far cleansed, a watery solution of salicylic acid is then applied. In my former remarks on salicylic acid I stated that I did not think that aqueous solutions of that substance would ever come into general use, on account of its slight solubility in water; but a more extended experience of watery preparations has convinced me that I was in error when I rather disadvised their employment. Though only sparingly soluble even in boiling water, still by adding a small proportion of borax, a lotion strong enough for any purpose can be readily obtained. The lotions I use contain respectively 5 and 10 grains of salicylic acid and $3\frac{1}{2}$ and 7 grains of biborate of soda to the ounce of water. No stronger watery solution can be required than the ten-grain one, and the presence of the borax is not in the slightest degree objectionable.

The plan I generally adopt is to commence with the weaker solution, and if I find that it is not sufficiently stimulating, I gradually increase the quantity of the antiseptic, and *vice versa*. The effects of these solutions are unequalled, for the growth of the granulations proceeds at a simply marvellous rate, deep hollows becoming filled up in a few days, and simultaneously epithelial formation proceeding rapidly in such parts as are ready for that process taking place. This seems to me to be the peculiarity of salicylic acid, for in the case of all other antiseptics with which I am acquainted, it is impossible to obtain rapid development of healthy granulation tissue and epithelium at the same time. For if a solution of say carbolic acid be employed of sufficient strength to encourage granulation growth, it will certainly impede or altogether prevent that of epithelium; and again, if the strength of the antiseptic solution be such as to favour the cicatrisation of a wound, it will not be stimulating enough to further the filling up of the less advanced portions of the raw surface. In this particular, then, salicylic acid differs from all other antiseptics, for when dressings impregnated with it are employed, both indications are fulfilled, healthy granulations springing up in abundance in the deeper parts of the wound, and cicatrisation taking place at the edges. The granulations are small and extremely vascular; this is absolutely the rule, and so far as I have seen, it has no exception; so certain am I of it, that when I order salicylic acid to be applied, I feel perfectly assured that within a very short space of time the wound will present as healthy an appearance as could be desired. This is undoubtedly a strong statement; but experience has shown me that I am justified in making it, and if put to the test, I know that every member of my excellent staff of dressers would bear me out in what I have said. It has been alleged that salicylic acid gives rise to severe pain; but this I have never found, slight smarting being the nearest approach to any such sensation that I have yet heard of, though I have questioned and re-questioned many whose wounds were dressed with salicylic applications, and even when that was experienced, all the patients have assured me that it was merely momentary, and that, too, in cases where preparations containing a large percentage of the agent were employed, and even when the pure acid has been applied. As I cannot possibly account for this discrepancy of opinion, I need not dwell on it, especially as I feel convinced that if a reliable sample of the acid be employed no such symptom as severe pain will show itself.

I have as yet only alluded to watery preparations of salicylic acid, and I entered on their consideration first, not on account of their being more generally useful than the many other forms

in which it may be prescribed, but because, so far as I am aware, they have been even less used than the others, and for the personal reasons already given.

Various forms of ointment may be compounded, as salicylic acid, unlike boracic acid, can be readily incorporated with fatty substances; but it would answer no useful purpose to repeat at length what has already appeared in a medical periodical regarding the different unctuous preparations of salicylic acid, so I shall simply give the formulæ for two ointments which I have found of much service. The following is perhaps the most generally applicable of any:—Salicylic acid 3 ss.— 3 j., white wax 3 j., paraffin 3 ij., almond oil 3 ij.; melt and rub up in a heated mortar. This ointment, which is merely a modification of Professor Lister's boracic ointment, should be spread on strips of muslin or fine linen, and is a thoroughly trustworthy antiseptic application. The other ointment is a simple admixture of the acid and simple ointment, Wagner states that in making it it is advisable to use alcohol as a solvent, as the direct mixture of the acid and lard does not give the same good results; but as I have long been in the habit of using it in its more simple form, and have obtained most excellent results, I have not thought it necessary to change my original formula. The proportion of the acid varies with the use to which the ointment is to be put; in the cases in which I have chiefly prescribed it —viz., circumscribed eczematous affections of the head and face, I have found half-a-drachm to a drachm to the ounce wonderfully efficacious—and if any one be dubious regarding the therapeutic value of salicylic acid, let me advise him to prescribe it for a case of the kind mentioned, and I feel persuaded that the result he will obtain will at once convince him of the efficacy of the agent he has employed. On this point I cannot speak too emphatically, for I have now used it in a large number of cases, and the results were uniformly good, far surpassing any mode of treatment I have yet seen in the practice of others or in my own, so much so that I have come to regard salicylic acid as a specific in cases of eczema narium and such like affections, and I hope at a future period to give in detail a series of cases treated by salicylic ointment.

Oleaginous preparations of salicylic acid are the least elegant of all the forms in which it can be prescribed, as it is hardly at all soluble in oil; still they may be used with good effect in burns, healing action quickly taking place under this mode of treatment, putrefaction, if it be present, being arrested, and fœtor at once disappearing.

I have now endeavoured to state as briefly as possible some of the advantages of this new antiseptic, and I feel satisfied that salicylic acid only requires a fair trial to be looked on as

an invaluable addition to our list of curative agents. When I first employed it I was inclined to regard the statements of those who extolled its use in the light of *omne novum pro magnifico*, but in this I was agreeably disappointed in the very first case where I prescribed it, and the conviction then arrived at has taken deeper root with each fresh case in which it has been used, and I firmly believe that ere long salicylic acid will occupy, if not the first, at least one of the foremost places, among antiseptics.—*Med. Press and Circular, June* 21, 1876, *p.* 502.

12.—ON THE USE OF SALICYLIC ACID AND SALICIN IN ACUTE RHEUMATISM.

By Drs. STRICKER, RIESS, BROADBENT, MACLAGAN, &c.

Among the results obtained from the internal use of salicylic acid, its effects not only as an antipyretic but almost—if the statements already made be supported by further observations—as a curative, in rheumatic fever, are most noteworthy. Several articles on the subject have recently appeared in the German and other periodicals, from which we make the following quotations.

Dr. Stricker writes (Berliner Klinische Wochenschrift) as follows. For several months, all the cases of acute articular rheumatism in Professor Traube's wards have been treated with salicylic acid. In all the patients thus treated, not only has there been arrest of the increase of temperature within forty-eight hours, generally much sooner, but they have been freed from the local symptoms—swelling, redness, and tenderness of the joints. He regards salicylic acid, apart from its antipyretic action, as the most active, perhaps as a radical, remedy in acute articular rheumatism. He insists on the use of pure salicylic acid, which is in the form of white glistening needles, tasteless, and perfectly soluble in water and alcohol. The irritant action on the mucous membrane of the mouth, œsophagus, and stomach, appears to be due to impurities. Pure salicylic acid can be given in rather large doses without producing any troublesome effects of the kind on the mouth and pharynx, even though it gives rise to dryness of the mucous membrane, followed by slight burning and by increased secretion. He gave pure salicylic acid in hourly doses of 7½ to 15 grains in a wafer, washed down with water like a pill. The doses were continued until the previously affected joints could be moved without pain. To attain this end, sometimes larger, sometimes smaller quantities were required; never more than 15 grammes or less than 5 grammes (225 grains and 75 grains). The only general symptoms produced were diaphoresis, noises in the ears, and difficulty of hearing; in two cases there was abnormal cheerfulness. Sufficient data do not yet exist for determining the

action of salicylic acid in arresting or preventing cardiac disease.

Dr. Stricker's observations are based on peculiar cases, of which he relates two under the following headings: 1. Rheumatic polyarthritis; third attack; insufficiency of the aortic valves; complete arrest of the disease in twenty-four hours. 2. Rheumatic polyarthritis; cure within forty-eight hours; recent endocarditis on admission, which remained uninfluenced by the treatment, and led to slight mitral insufficiency; pericarditis, commencing when the treatment was begun, disappeared under the continued use of salicylic acid. 3. Rheumatic polyarthritis running a slow course, with slight rise of temperature. When the patient was in hospital, rapid swelling and pain of several of the large joints, with increase of local temperature. Cure within forty-eight hours. 4. Rheumatic polyarthritis; strongly marked local affection; cured within twenty-four hours. 5. Rheumatic polyarthritis; two attacks; the first subdued in forty-eight, the other within twenty-four hours.

Riess contributes to the same journal an article on the use of salicylic acid, especially in acute articular rheumatism. He gave it in twenty-seven cases in the Berlin General Hospital; in the first twenty-three as an antipyretic when the temperature reached 102° Fahr. The antipyretic action was almost always very good; the lowering of temperature often lasting a day or even longer. The following were the numbers of doses required to produce complete reduction of the pain:—in six cases, 1 dose; in five cases, 2 doses; in two, 3 doses; in one, 4 doses; in two, 5 doses; in one, 6 doses; in four, 8 doses; in one, 15 doses; and in one, 20 doses. The fall of temperature was usually soon followed by relief of the affection of the joints and general improvement; but this was more constant in the earlier cases. After an improvement for one or nine days, a return of the joint affection with or without increase of temperature was often observed. The time required for complete cure —*i.e.* removal of the pain, swelling, and stiffness of the joints —was in one case three days; in two, four days; in two, six days; in two, seven days; in two, eight days; in one, eleven days; in one, thirteen days; in two, fourteen days; in one, fifteen days; in two, six weeks; in one, seven weeks; in two, two months; in four, more than two months. Of the last four cases, two were protracted by tedious complications—pericarditis in one, and periostitis of the femur in the other. With the exception of slight endocarditis in some, the remaining cases were uncomplicated.

Riess has lately used, in six cases, salicylic acid in small doses (not exceeding fifteen grammes) in solution of phosphate of

soda, as recommended by Stricker. Two of the patients had been already treated by salicylic acid in large doses, but suffered from obstinate relapses, principally in the form of pains and stiffness of the joints. One of the patients took 165 grains of salicylic acid in solution of phosphate of soda in a day and-a-half; the other took 4½ drachms in the same way in two days, the doses being given every one or two hours. In both the pains were relieved, but returned when the medicine was discontinued. Of the other four cases, a very favourable result was obtained in one only, and in none of these was any effect produced on the duration of the disease. The disappearance of the symptomatic fever was, however, constant. In one of the four cases, the local symptoms disappeared in three days: in the others, it remained unaffected, although the medicine was given in large doses.

Riess says that in several necropsies of patients to whom salicylic acid had been given in substance, he found traces of its action on the mucous membrane of the œsophagus, stomach, and intestine.

While he points out the great difficulty of arriving at results in the treatment of acute articular rheumatism, he comes to the conclusion that neither his own cases nor those related by Stricker prove that salicylic acid is a certain remedy in this disease. He formulates his opinion as follows. Salicylic acid acts as an excellent antipyretic in acute articular rheumatism; the reduction of temperature produced by its administration is generally attended with relief of the joint-affection, and it appears that in favourable cases, which come early under treatment, the duration of the disease may be cut short.

Besides the mixture of salicylic acid with solution of phosphate of soda, Riess has used commercial salicylate of soda. A full dose of this is ninety grains (equal to about seventy-five grains of salicylic acid); it is best given in the following form; salicylate of soda, six parts; distilled water, twenty parts; liquorice juice, five parts. This solution is readily taken, and is rarely followed by vomiting.

In a second article on the same subject, Dr. Stricker replies to some criticisms by Riess, and formulates the conclusion at which he has arrived in the following words. 1. Salicylic acid appears to be a rapid and radical remedy in recent cases of genuine acute rheumatism of the joints. 2. It is not injurious to the human organism when administered every hour in doses varying from 7½ to 15 grains. 3. It can be given in these doses for a longer time to young and strong individuals than to the old and feeble. 4. In the latter, it produces toxic symptoms more readily than in the former. 5. The toxic symptoms vary in degree. 6. Those most commonly met with are noises in the

ears, difficulty of hearing, and diaphoresis; when these occur, the administration of the medicine should be discontinued. 7. If salicylic acid be found to fully answer the expectations entertained regarding it, the internal administration of a certain quantity may be expected to prevent the occurrence of fresh attacks in hitherto unaffected joints, and also secondary inflammation of serous membranes, especially the endocardium. 8. To prevent relapse, the medicine must be continued in smaller doses for some days after the termination of the main treatment. 9. Salicylic acid is of doubtful utility in chronic articular rheumatism. 10. It is not likely to be of use in gonorrhœal or diarrhœal rheumatism, or in the polyarthritis attending septicæmia.

Dr. Katz describes, in the Deutsche Medicinische Wochenschrift, a case of acute articular rheumatism successfully treated with salicylic acid. The patient was a man, in whom the fingers, wrists, shoulders, and knees were affected. Nitrate of potash, quinine, and morphia were given for ten days without relief. There was much pain and swelling; the temperature was 102° to 103° Fahr., the pulse 100 to 120. The administration of salicylic acid, in 15 grain doses hourly, was commenced on the tenth evening; and the next morning, a drachm having been taken, he was able to move both his hands freely, and even to move out of bed, neither of which he could do on the previous day. The medicine was continued. In the evening there was no fever, the pulse was 90, the respiration free; motion was not painful, and there was no swelling of the parts. Forty-eight hours after the commencement of the treatment by salicylic acid he was out of bed, and could walk without assistance.

Dr. Hildebrandt also describes a case of acute rheumatism in a girl aged eleven. From January 24 to 28 she had circumscribed peritonitis on the right side, which disappeared under the use of opiates and the application of bladders of ice. On the 31st, when Dr. Hildebrandt visited her, the temperature had risen to 97·9°; she could not open her mouth, and complained of pains in the ear; she could not move her arms, and movements of the left-hip-joint caused severe pain. Pressure under the lower jaw was painful; the elbows were slightly swollen, but not red, and movement of them gave great pain. Nothing abnormal was found on examination of the heart. About four grains of salicylic acid were ordered to be taken every hour in fennel-water. At 11 a.m. next day there was a considerable improvement in all the symptoms. The next night she slept well, and awoke next morning free from pain and fever. The salicylic acid was continued three times a day, in doses of one decigramme (1½ grain).

sipelas is the result of exposure to a vitiated atmosphere is, I think, rendered obvious by the following cases reported by the late Dr. Begbie, senior, who relates that a locality in the New Town of Edinburgh became vitiated by the effluvia arising from putrid animal and vegetable matter in the shops on the ground floor and sunk flat, and that in one of the houses above, entering from a cross street, all the inmates became sickly, and the man-servant was seized with a severe form of erysipelas. He was treated according to the practice then in vogue, and his "convalescence was slow and unsatisfactory, so that four or five weeks elapsed before the patient was able to resume his duties."

The family removed to another house, where the air was pure, and they soon all recovered their health, with the exception of the nurse, who became affected in a few days after the removal with erysipelas of a most inveterate character, thus showing that the disease must have been dormant in the system.

The wife of one of the shopmen in the vitiated locality referred to, "who was in the daily habit of attending her husband's place of busines, and assisting him in conducting it, was, during the progress of the first of these cases of erysipelas, carried home in the pains of childbirth, and died on the fourth day after delivery, with obscure indications of puerperal peritonitis, and rapid sinking." In this case we have an example of the same vitiated atmosphere, giving rise to two apparently different diseases, erysipelas and puerperal fever.

The following cases give a striking example of the idiosyncrasy which exists in some families to have several members affected at the same time. The village of the Water of Leith, celebrated for its unhealthiness from its visits of cholera, fever, and other epidemics, and where the Board of Education have chosen to erect one of their largest educational establishments, was visited by erysipelas. Two sisters, living under the same roof, apparently caught the disease from different sources, having resided apart from each other for some time, the one occupying their present dwelling, the other residing with a gentleman in a distant part of the town. At the opposite side of the same lane a man became affected, although he had no communication with the sisters; and, in succession, other three cases occurred in the same household. Thus showing that different people exposed to the same polluted atmosphere, although not having intercourse with each other, are liable to become affected with the same disease.

Dr. Begbie relates another case which still further illustrates the view under consideration: "Mr. B., of full habit, became affected with erysipelas, and after a tedious illness made a good

recovery under the treatment of the tincture of the muriate of iron. His brother, residing in a distant part of the country, with whom he had maintained no intercourse for many years, was attacked with the disease at the same time."

The following cases go to prove that similar results may occur in regard to diphtheria and scarlatina: Some years ago I was requested to attend a family occupying a large and apparently well-aired house in England. I found the youngest child, a delicate girl, was suffering from diphtheria. The head-nurse soon became affected, then the under-nurse, and in a short time eight of the family were laid up with the disease; but they all made a good recovery under the treatment of tincture of the muriate of iron. On inquiry, I ascertained that the drains were in good order, but the back-windows overlooked a large grass field, which had been recently "top-dressed," and the smell coming from it was most offensive. The disease appeared partially in the neighbourhood, and scarlatina became very general.

I was called a short time ago to see a family occupying a baronial residence in Argyllshire, situated on the banks of a loch, into which the sewage flowed. Seven of the family were first attacked with scarlatina, and, on recovery from it, two were seized with diphtheria of a severe character—the one case was followed by paralysis, the other by abscesses implicating the glands of the neck. The lady of the house escaped the fever, but she became affected with diphtheria and was very nervous; the disease was checked, however, by the tincture of the muriate of iron. The whole family made a good recovery. On examination, I found that the modern part of the mansion communicated with the older portion by means of a long passage, from which, especially at night, there came an offensive smell.

I am persuaded that erysipelas is most frequently the result of exposure to impure air—and in this respect it resembles the other diseases I have referred to, in all of which there is obvious blood-poisoning. If this be so, it is clear that the treatment should consist of the means which is calculated to remove the poison most rapidly from the system, and counteract its effects, without reducing the powers of life. With this view, after many years' experience, and considerable opportunities of judging, I confidently recommend the treatment with the muriated tincture of iron. I should not have thought it necessary to have repeated this opinion, having expressed it strongly in a previous paper, had I not observed in Professor Spence's recently published lectures, that he advocates the antiphlogistic treatment practised thirty years ago; at the same time, he not only underrates the value of iron, but condemns it altogether in some

cases. In example of this he says, "When the disease assumes an acute character, and is accompanied with a quick, full pulse, or in erysipelas of the head, when there is a tendency to violent delirium, iron should not be given." But the truth is, that, had he watched its effects, and understood its influence on the constitution, he would have discovered that the cases referred to are those in which the treatment by the tincture of muriate of iron is the most immediately beneficial. In proof of this I cannot do better than quote the case of the nurse referred to in the former extract from Dr. Begbie's work. He informs us that she was a fine healthy woman approaching the age of fifty. "She was seized with symptoms of acute illness, commencing with violent headache, flushed face, severe pain in the lumbar region, great febrile excitement, and high delirium. With these symptoms the erysipelatous rash appeared on the right ear, and quickly spread over the same side of the face in the course of the night. The aspect of the case at this early stage indicated a severe and lengthened illness; indeed, I do not remember to have seen for a long time one which, from the constitutional disturbance and local symptoms, threatened a more unfavourable issue." "Seeing that the case was of a severe character, I hesitated placing reliance on iron alone, and directed the abstraction of twelve ounces of blood from the nape of the neck by cupping, and the administration of a full dose of castor-oil. These means being premised, and having observed that the urine passed in the course of the day—the second of the illness—was of a red colour, and scanty in quantity, that it was loaded with biliary matter, and presented, under the microscope, numerous blood-corpuscles, and many crystals of the triple phosphates, I ordered the muriated tincture in manner recommended by Mr. Bell, in doses of twenty drops every two hours, continued through the night and day. At the end of twenty-four hours there was a marked remission in all the more prominent symptoms; the erysipelas was arrested; the headache subdued; the delirium overcome; the pulse reduced in frequency and force; the skin covered with a gentle moisture, and bereft of its burning heat; the pain in the back removed; and the urine rendered more copious, and freed from most of the blood and bile of the previous day. The remedy was continued for twenty-four hours longer; and without experiencing any unpleasant effects, the patient was convalescent at the end of the fourth day, presenting a striking contrast to the case of her fellow-servant, who, with symptoms of a less severe character, suffered from illness during many weeks." Dr. George W. Balfour, who is not a likely person to take an erroneous impression on any subject, says, "I have treated all my cases, upwards of twenty years, with iron, and had have

no cause to regret my doing so. On the contrary, erysipelas is one of the few diseases for which I now believe we have a certain and unfailing remedy, and this whether it is infantile or adult, idiopathic or traumatic."

The remedy must be given in the full quantity and frequency which I have recommended in order to produce its beneficial effect in the severer forms of the disease; and if any one expects to accomplish this desirable object by the use of the tincture of the perchloride of iron, either in erysipelas or any of the other diseases referred to in this paper, they will be disappointed, as such is the result of my experience both in erysipelas and diphtheria. Two illustrations may here suffice. I hold that a material difference exists between the effects of the two so-called similar preparations of iron—viz., the muriate and perchloride—both of which I have fully tested, and could give many instances of their marked therapeutic difference. In regard to erysipelas, I was attending a lady who was severely affected by it after a tedious attack of rheumatic fever. I ordered her to have thirty drops of the tincture of the muriate of iron every two hours; but to my great disappointment, I found that she went on day after day without any improvement. I then asked to see the medicine she was taking, when I discovered it was the tincture of the perchloride, sent by mistake by the chemist. I immediately changed the medicine for the tincture of the muriate of iron, and in a few days the disease disappeared.

I was requested a short time ago to attend a young lady suffering under a severe attack of diphtheria. She had been taking for some time the tincture of the perchloride of iron, with little apparent benefit, as her pulse was 110, and her throat covered with diphtheritic membrane. She was put on the tincture of the muriate of iron, and had her throat swabbed with a solution of Condy's fluid several times a day. The membranous deposit rapidly disappeared, and the pulse in two days fell to 80, and in the course of a week she was quite convalescent.

In conclusion, I have again to state, in regard to the treatment of erysipelas with the tincture of muriate of iron, that I have the most perfect reliance on it; and that when it has failed, the fault has been not in the remedy, but in the mode of administering it. I hold that no one is justified in condemning it until they have given it as recommended, and found it fail in effecting a cure in uncomplicated cases. Of course, I admit there are cases complicated with other virulent diseases, in which no human aid can be of any avail; or it may not have been had recourse to until after the system has fairly succumbed to the disease. Such cases must form an exception. In short, if any remedy is entitled to be called a specific, it is so; at all events, as much so as quinine is in ague.—*Edinburgh Medical Journal, August* 1876, *p.* 98.

14.—CASE OF ACUTE RHEUMATISM TREATED WITH SALICYLATE OF SODA: RAPID RECOVERY.

By Dr. TALFOURD JONES, University Medical Scholar; Physician to the Breconshire Infirmary.

Mr. William Price, aged 46, innkeeper, got out of his bed on Saturday morning, May 20th, 1876, at five o'clock, in order to drive away a dog that was barking. He went into the street and stood in the cold with nothing on but his night-dress, not even his stockings. On Monday, May 22nd, he felt cold, chilly, and poorly. On the 23rd, he could not get out of bed, because of pain and swelling in his ankles, insteps, and wrists. On May 24th, I visited him for the first time, and found him in bed, on his back, in much pain; pulse 92; temperature 101.2 deg. Fahr. The tongue was furred; the skin only slightly moist. He had thirst and anorexia. The ankles, insteps, wrists, and parts of the hands were very red, swollen, tender, hot, and painful. The patient was unable to move them. He had no sleep the previous night because of severe pain. The bowels were opened after medicine. The urine was high-coloured, scanty, with much lithates. He had slight cough. There was no cardiac murmur. He was ordered to have the inflamed joints packed in wadding, and to take thirty grains of salicylate of soda, dissolved in an ounce and a half of water, every three hours. At 10 p.m., he had taken four doses. Pulse 80; temperature 100 deg. Fahr. The skin was much moister. The patient said he felt very much better. He had no pain in the ankles or in the left hand, and only a slight pain in the right wrist and hand. He could now use the left hand freely. The bowels had acted once since the morning visit. He complained of soreness and heaviness of the eyelids, and of a slight frontal headache, which had come on since he began the medicine; and he seemed to be somewhat deaf. He was ordered to take a dose of salicylate of soda at 12 p.m., and another at 6 a.m. to-morrow, and afterwards every three hours.

May 25th, 11 a.m. Pulse 78; temperature 99.8 deg. Fahr. The skin was moister, and the tongue cleaner. He had had a comfortable night. The pain in the right hand left him in the night, and since then he had been absolutely free from pain. There were now no local signs about the joints, save a little swelling of the left instep. There was a little soreness about the eyelids. The patient said that he had received great benefit from the medicine, and that it caused no soreness about the throat, nor did it give rise to any unpleasant sensations in the mouth or throat either during or after the act of swallowing. He had now taken since noon yesterday—*i.e.*, in twenty-three hours—seven doses of the salt. After the eighth dose, he was ordered

to take twenty grains every three hours, in an ounce of water. —9.20 p.m. Pulse 78; temperature 99 deg. Fahr. The skin was moist, and the tongue cleaner. He had continued free from pain. He had had one natural stool. The urine was turbid, with lithates. He had taken three of the twenty-grain doses: he was ordered to take the rest at twelve noon, and none afterwards, until 9 a.m. to-morrow. There was no soreness about the eyelids; no headache. There was slight deafness. The patient had taken light food in good quantity to-day, and he now suggested that he might be allowed to get up to-morrow.

May 26th, 12.15 p.m. Pulse 70; temperature 98 deg. Fahr. The skin was moist; the tongue still cleaner. He was somewhat restless during the early part of the night, but very sleepy all the morning. The deafness had left him; the fever was gone: there was neither pain nor any local signs about the joints; only a little stiffness about the ankles. He could use his hands freely, and could kick his legs about. The medicine was ordered to be continued, but in less frequent doses; the next dose to be given at 6 p.m. After this he continued to improve. On the 27th, he ate roast beef to his dinner; and on the next day walked down stairs.

Remarks.—In the first twenty-four hours of treatment—*i.e.*, from noon on May 24th till noon on the 25th—he took eight doses of thirty grains, in all two hundred and forty grains. In the succeeding period of twenty-four hours, he had six doses of twenty grains—total, one hundred and twenty grains. In the third period, he had three doses of twenty-grains—total, sixty grains. During the fourth period, he had two doses of twenty grains—total, forty grains. Altogether, in four days he had four hundred and sixty grains. On the second day of treatment, after taking the seventh dose, the patient was absolutely free from pain; nor was there any tenderness about the joints, even under rough handling. The temperature fell within twenty-four hours from 101.2 to 99.8 deg.; in the next period to 98 deg.; and on the third day to 97.4 deg. The pulse fell at the end of the first twenty-four hours from 92 to 80, thence to 70 on the third day. The patient was getting worse when he was first seen by me; and although the pyrexia was not very marked then, I am sure it would have been more pronounced that night had it not been for the medicine, the apyretic effects of which were soon manifested. Twenty years ago, the patient had an attack of rheumatic fever, which confined him to his bed for thirteen weeks. In November 1870, I attended him for an attack which lasted sixteen days. He was then treated with bicarbonate and nitrate of potash and opium, with chloral and morphia at bed-time. In this last attack, I gave salicylate

of soda in preference to salicylic acid, because the latter has been said to cause more or less soreness of the throat. The soda-salt dissolves instantly in water, and twenty grains in an ounce make quite a pleasant draught. The salt was procured from Messrs. Battley and Watts.

About a month ago, Dr. Clouston of Hay told me of two cases of rheumatic fever which he had most successfully treated with salicine.—*Brit. Med. Jour.*, *June* 17, 1876, *p.* 752.

15.—ON THE TREATMENT OF RHEUMATIC FEVER BY TINCTURE OF PERCHLORIDE OF IRON.

By Dr. SAMUEL S. DYER, Ringwood.

The variable climate of England, and the amount of moisture in the air of the Avon Valley, have given me frequent opportunities of testing the different kinds of treatment that have been proposed or recommended for rheumatic fever. My first interest in its history and treatment was occasioned by the serious illness of my father from this cause just as I had entered the medical profession, and I have good reason to remember his early prognostication of six weeks' inability to see his patients, and a month of severe suffering. The medicinal treatment at that time consisted of calomel and opium in a pill every four hours, and bicarbonate of soda in a mixture with aromatic spirits of ammonia. Tedious and suffering as the actual illness was, the convalescence was even more unsatisfactory, as may be well imagined, after the combined effects of illness and mercurial treatment for three or four weeks. After a while, the greater alkaline treatment was strongly advocated by those whose opinion and practice were worthy of example, and all my cases were treated with large doses of bicarbonate of potash or soda, or with nitrate of potash in solution, and an opiate at night; the affected joints being thickly covered with cotton-wool and oiled silk, as first suggested by Dr. Todd.

The treatment by large doses of nitrate of potash was decidedly an improvement, and my case-book for 1850 gives, amongst others, two very satisfactory examples, where severity of symptoms only continued a week, and the convalescence was proportionately shortened. The dose taken was a scruple every four hours.

Cases treated by alkaline instead of neutral salt were very slow in recovering, and the patients were weak and pallid for some time afterwards. There can be no doubt that the large quantity of alkali taken into the system produced a deleterious effect upon the blood; nor was the immediate operation of the medicine satisfactory, for, even when the urine had become less acid, and in some cases even phosphatic and alkaline, the sour

perspiration was still persistent, and the joints were still swollen and painful; in fact, the treatment was not curative in the common acceptation of the term, and it may well be questioned whether the after-consequences of such medication were not worse than would have resulted from letting the disease run its course; a course which, with rest and careful regimen, naturally tends to recovery, as shown by Sir William Gull and Dr. Sutton.

Both Dr. Owen Rees and Dr. Wilks greatly altered the line of treatment until recently in vogue, by the administration of an acid rather than an alkali; Dr. Rees upon chemical principles, and Dr. Wilks, at first, simply to try whether or not the supposed success of potash or of soda was due to the medicine; but Dr. Wilks's first case treated with dilute nitrohydrochloric acid was so satisfactory in its progress and result, that he subsequently adopted the treatment in other cases from conviction of its good effect. The plan adopted by Dr. Rees of giving lime-juice frequently and in large quantities has much to commend it, and has one objection only that I can see (but this, to a man practising in an obscure country district, is very considerable), it is the difficulty and expense of getting the supply of fresh lime-juice: lemon-juice does not appear to produce an equally good effect, and no artificially made imitation will answer the purpose.

It was in 1869 that Dr. Russell Reynolds reported in the British Medical Journal some cases of rheumatic fever treated by tincture of perchloride of iron; and I determined, on the first opportunity that should occur, to avail myself of his suggestion, and give my patient the benefit which I firmly believed would result from the treatment. In the state of system predisposing to rheumatic fever, we have an acid-*generating* condition rather than an acid one; for this the muriatic acid is highly beneficial, as seen in the treatment of acidifying forms of dyspepsia. In every case of rheumatic fever which had come under my notice, there had been a tendency to anæmia, always attributed by me to the spanæmic effect of alkalies administered, but, after all, probably, accountable to the disease itself; and, from these circumstances, it seemed that the treatment by the muriated tincture of iron would effect two most desirable indications.

Every case that has been treated by me on this plan has been one of true rheumatic fever, with inflammation and swelling of larger joints, quick pulse, and high temperature; and those to which I would here more particularly allude have been second or third attacks, thus giving the patient as well as myself an opportunity of judging by comparison of the value of the medicine.

The first case was in the spring of 1870, when a woman, aged

37, was taken ill with every symptom of acute rheumatism, from which she had suffered twice before. She was at once given a mixture of two drachms of tincture of perchloride of iron in eight ounces of water, of which to take a sixth part every four hours, and an opiate pill for that night. The sheets were removed from the bed, the diet regulated, but nothing else suggested or done. On the following morning, she expressed herself as being more comfortable; the next, still better; and, on the third day, as being quite free from all pain, and able to move freely. Her constitutional symptoms were correspondingly improved, and without question or solicitation from me she expressed surprise at her rapid recovery, and the marked effect of the medicine. I only attended her on this occasion ten days.

A strumous, delicate young woman, aged 20, had an attack of rheumatic fever when a child, which confined her to the bed and house for five weeks. In January 1875, I was sent for to her, and found that she had acute rheumatism fully established. She was in so much pain that I gave her five grains of Dover's powder, with ten of nitrate of potash, every four hours; but, on the next and the following days, there was no improvement in any of the symptoms; this treatment was therefore discontinued, and the tincture of perchloride of iron in twenty-drop doses every four hours substituted. Within two days there was a marked change in the symptom; by the end of a week all sign of acute rheumatism was gone, and in a fortnight she was fairly well, but continued to take iron as a tonic for some time longer.

A young woman came to the surgery in the spring of 1875 with commencing symptoms of acute rheumatism, from which she had suffered severely three years before. She had a loud aortic systolic bellows-sound, the result of that illness. She was sent to her lodgings, and, feeling somewhat better, the next day she resumed her work, but very shortly had to lie up altogether. My brother attended her, and gave her tincture of perchloride of iron as the only medicine. She made a rapid and complete recovery, although the symptoms, from the day she first returned to work in the commencement of the illness, were very marked and severe.

A lady, aged 67, had had two severe attacks of rheumatic fever in former years. She has a seriously damaged heart from aortic obstruction, dilated cavities, and mitral insufficiency, and, during the last five years, has had occasional attacks of dyspnœa, passive congestion of lungs or liver, œdema of feet and ankles, peritoneal effusion, and so on, necessitating treatment with pilula hydrargyri, compound squill and digitalis pill, compound jalap powder, and mixtures of iron and digitalis. On February 23rd, 1875, she sent for me, complaining of severe ab-

dominal and lumbar pains greatly increased on any movement of the body, deep inspiration, or cough. There was not any fever, no quickness of pulse nor heat of skin; the urine was neither scanty nor high coloured. She had been sitting a day or two before in a draught between an open door and window. As I considered it was simply muscular rheumatism, I advised her to completely cover the painful parts with wadding and flannel, and gave her a mixture containing small doses of aconite, chlorodyne, and chloric ether. She did not get any relief, and, by the 26th, it was evident that a severe attack of acute rheumatism had set in. Temperature 102; pulse 130, irregular and unequal, as it always has been since I have known her. The urine was very scanty and high-coloured; there was abundant sour smelling perspiration; the elbows, knees, wrists, and ankles, were much swollen, very red and painful. Matters were so alarming, that absent members of the family were telegraphed for, and the patient was most desponding. Treatment by tincture of perchloride of iron (fifteen drops every four hours) was now commenced and steadily persisted in. On the 28th (fifth day of illness, and second of more marked symptoms of rheumatic fever), matters were still very unfavourable; the joints were, as before, much swollen and exquisitely tender. On March 1st, all symptoms were less severe, and, on each succeeding day, there was marked improvement, so that, by the end of a week, the patient was considered convalescent, although from her naturally feeble frame it was some time before strength was established, or the weather of the last spring would justify our letting her out. She has not had the slightest return of rheumatism, but the dropsical effusion has twice recurred, and each time has been relieved by the accustomed remedies. This patient is a woman of good intelligence, and as she was recovering from the acute rheumatism, she asked, "What is that wonderful medicine I am taking? Each dose seems to do me good, and I never recovered so quickly in either of my former attacks."

The next case to which I would allude will not appear so favourable as the four of which I have been speaking, inasmuch as it was obstinate at first, attended by two severe relapses, and followed by a prolonged debility before thorough and complete recovery was established. It was that of a youth aged 19, having in-door employment, but having an exposed walk to and from his work by the river and fields, and living near the water's edge. He, too, had suffered from a former attack of acute rheumatism. On this occasion, he was first taken ill on May 22nd last, and continued much in the same state for a week, but the first week in June he became much worse; temperature 103; pulse 130. He had

great pain in the cardiac region, and mitral systolic *bruit;* scanty high-coloured urine, depositing dark red sediment in great abundance; profuse acid perspiration, but not much pain in the joints. A blister was applied over the heart, and twenty drops of tincture of perchloride of iron given every four hours. The next day, June 14th, he was in much the same condition as to temperature and pulse, and general symptoms, but after this he began to improve, and rapidly became, to all appearance, convalescent; but he was not free of the predisposing rheumatic poison, for, on July 3rd, I was sent for to him, and found him as bad as ever, with high fever; temperature 104; pulse 130; pain at the heart, anxious expression, and pains at the shoulders, knees, and ankles. A blister was again applied, and the iron mixture given as before. In the two following days the state of this patient was much the same, and, on the 6th, the third day of relapse, I went to Swanage and left him under the care of my brother; on this day the temperature was above 104; pulse 130; and all the acute rheumatic symptoms very severe. On July 8th, the fifth day of the accession of illness, I came home for two hours and saw this patient. He was wonderfully better, sitting up in bed, with cheerful countenance; all symptoms of fever were gone; and rheumatic pains had also left.

One other case has occurred since this, having the same conditions I set down at the commencement of this communication, as rendering it worthy of record by its bearing upon the question; viz., high temperature, quick pulse, inflammation, and swelling of larger joints in a person who had previously suffered from a similar illness.

A delicate lad, aged 17, was taken ill with all the symptoms of acute rheumatism. I removed the sheets, placed him between the blankets, and at once commenced the treatment with perchloride of iron. On the fourth day of treatment, he was quite free from pain as well as from fever, and made a rapid recovery.

Although the fifth case, taken as a whole, was not so satisfactory as one would wish to have recorded, on account of the relapse which followed premature exposure to damp air, the wonderfully marked improvement from very acute symptoms between the 6th and the 8th of July was most gratifying, and I never saw such good result in any other case of acute rheumatism, nor from any other kind of treatment. I think it tells immensely in favour of the plan recommended by Dr. Russell Reynolds, a plan of treatment which must be ranked with those which are said to characterise the present age; that of trying, or adopting, a special remedy for a special disease, rather than its treatment upon general principles. To some

extent this may be the case, but we shall generally find that, even while adopting a special remedy, we are at the same time acting upon sound general principles. Dr. Reynolds tells us that he was first induced to give this medicine in acute rheumatism from its well-known value and efficacy in rapidly spreading inflammations, of the skin in erysipelas, and of the mucous membrane in throat-affections.

In conclusion, I have only to add, that the result of a fair trial of this plan of treatment in my own practice, of which the foregoing are but half-a-dozen, selected from many other cases, has been so satisfactory, that I should most decidedly adopt it in every case, unless the patient should happen to be hyperæmic and plethoric, when I should go back to the treatment of former years, that by large doses of nitrate of potash, from a recollection of its efficacy. — *British Medical Journal, May* 6, 1876, *p.* 563.

16.—VIRCHOW ON THE RELATION OF TYPHOID FEVER TO DRAINAGE.

By the EDITOR of the MEDICAL TIMES AND GAZETTE.

Professor Virchow, of Berlin, contributes to the Deutsche Medicinsche Wochenschrift, Nos. 1 and 2, 1876, an interesting paper on the relation of typhoid fever to the cleanliness of towns; and first he shows how the mortality from this disease had been diminished in certain German towns by providing them with a proper system of sewers. Thus, in the case of Hamburg, which has had a regular system of sewers longer than any other German city, the most carefully prepared statistics show that while in the seven years before the introduction of sewers (1838-44) the mean mortality from typhoid fever per thousand deaths from all causes was 48·4, in the nine years (1845-53) while the sewers were in progress it fell to 39·3; while in the first eight years (1854-61) after the works were completed it was 29·3, and in a second period of eight years (1862-69) it diminished to 25·7—that is to say, to almost less than half what it was before the sewers were made. In the years 1872-74 the reports of the medical inspector, Dr. Kraus, revealed the important fact that the proportion of those suffering from typhoid fever was on the average in a thousand living persons 2·68 for the parts of Hamburg in which the sewer system is complete, 3.2 for those districts in which it is nearly but not quite finished, and 4·6 for those which have no sewers at all—namely, the country districts beyond the suburbs. In two of the villages included under the latter category the average sickness per thousand from typhoid fever in 1872 was 7·0 and 6·6, against 2·68 in the city itself—a startling contrast, not at all favourable to the rural districts.

Another example of the influence which may be exerted over the prevalence of typhoid fever by proper measures is shown by the case of Halle. This town during 1852-61 had an average annual mortality from typhoid of 36; in 1862-65 a severe epidemic raised the mortality to 194, 215, 254, and 160 per annum; in 1866-69 the deaths were 62, 65, 65, and 42 respectively; and in 1870 they fell, *with the introduction of a new water supply*, to 14! Professor Virchow passes on to consider the distribution of mortality from typhoid fever over the different seasons of the year, and he shows that in Berlin the number of deaths from this cause begins to increase with great constancy in July, is very high in August and September, and highest in October; in December and January it falls, and reaches its lowest point in March, rising again a very little in April and May, and falling once more low in June. The same state of things holds good for Thüringen, Nassau, Saxony, Silesia, and French Switzerland, also for Schleswig-Holstein.

On the other hand, this rule no longer applies when the statistics of certain parts of Bavaria, including Munich, are compared with those of Berlin and North Germany, for here, speaking generally, the winter and spring, and especially the period from January to April—the best time in North Germany—are the most unfavourable, though the acme is reached in Munich more towards the spring than in the rest of Bavaria, where the winter months suffer most. Both for Munich, however, and the rest of Bavaria, the fact remains that the warmer months show the least mortality from typhoid. For those who are specially interested in this subject Professor Virchow supplies the necessary figures in support of his statements; it is however, more suitable to our present purpose to give the conclusion to which he has come as to the cause of the difference between the season of greatest typhoid mortality in North and South Germany, taking Berlin and Munich as representatives of the two districts. Both towns are built on a comparatively level and very porous soil, that of Munich being the more porous of the two. Now, in both cases statistics show that the one condition which bears a constant, *but inverse*, ratio to the mortality from typhoid is the height of the water in the soil (*Grundwasser*), as estimated by its level in the wells. Now, in Berlin the wells are fullest in the winter or spring, especially in February and April, and they are lowest in the summer or autumn, especially in September, October, and November. In Munich, on the other hand, they are fullest in the summer (July and August), and lowest in the winter (December and January). In both cities, as the water rises the typhoid diminishes, and *vice versâ*.

In the course of his paper, Professor Virchow takes occasion

to point out the position which he occupies at present with reference to Pettenköfer's theory that the rise and fall of the water in the soil (*Grundwasser*) is the main element in producing typhoid epidemics. He admits the truth of Pettenköfer's theory with regard to certain places—*e.g.*, Munich and Berlin,—but denies that it is universally applicable. He considers that the *Grundwasser* only exerts an influence where the soil contains impure matters, or where it is itself impure. "Pure *Grundwasser* in a clean soil I so little regard," he says, "as a cause of typhoid, that I never hesitate either to allow it to be used as drinking-water, or even to propose its use."

Professor Virchow believes in the origin of typhoid by contamination of drinking water with impurities soaking into them from without, which Pettenköfer appears to deny, in spite of a great array of facts. On one other point, which is independent of the *Grundwasser* theory, he is at issue with Pettenköfer. The latter does not believe in the *contagious* nature of typhoid fever, nor does Virchow claim for contagion a large share in the production of epidemics. What he says is this: that he has been convinced, not only by the numerous reported cases which have occurred in villages and small hamlets, but also by a series of house epidemics which he has been able to carefully investigate at Berlin, that typhoid fever can be transferred from one person to another. Whether long cohabitation, he adds, be necessary or not to make the contagion effectual, the fact remains that it can be so transmitted.

Although there may be little or nothing that is novel in the contents of Professor Virchow's paper, yet its writer's fame and influence in Germany are so great that all that falls from him deserves consideration.

In urging on the introduction of scientific drainage and wholesome water-supply into the backward cities of his native country he is rendering a vast service to it, for in sanitary matters as yet Germany does not take the lead.—*Medical Times and Gazette, Sept.* 30, 1876, *p.* 386.

DISEASES OF THE NERVOUS SYSTEM.

17.—THE DIAGNOSIS AND TREATMENT OF NEURALGIA.

By Prof. WILHELM HEINRICH ERB, Heidelberg, Baden.

[The following extract is from Dr. Foot's review of Mr. Henry Power's translation of Prof. Erb's work on Diseases of the Peripheral Cerebro-Spinal Nerves, forming the eleventh volume of Dr. Ziemssen's Cyclopedia.]

In making the diagnosis of an attack of neuralgic disease, it is in the first place requisite to determine *whether neuralgia is*

really present. No term is more loosely or conveniently used. The difficulties, which are occasionally considerable, may, in general, be surmounted by recollecting that the following are essential and characteristic symptoms of neuralgia:—1. That the pain is limited to a definite nerve-path, either trunk, branch, or area of distribution, and that it is usually confined to one side. 2. That the pain is, without any obvious reason, either intermitting, or at least distinctly remitting, in character. 3. That the pain presents very peculiar characters, and is extraordinarily acute. 4. That there are certain spots in the course of the nerve, or in the area of its distribution, that are very sensitive to pressure (points douloureux). 5. That the pain is associated with certain sensory, motor and vaso-motor, and secretory phenomena. 6. That the pain is unaccompanied by any inflammatory or local symptom, or any general disturbance of health at all corresponding with the amount of subjective disorder. The diagnosis will be greatly strengthened by the ascertainment of the various predisposing conditions. The painful affections, which are especially liable to be mistaken for neuralgia, are all those painful affections, "myalgias," that are localised in the muscles, *muscular pain*, *muscular rheumatism*, and which are known under the names of lumbago, pleurodynia, torticollis, and the like, and which arise either from catching cold or from over-exertion of the muscles. The diagnosis between such pains and the various forms of neuralgia is to be established by attention to the following points:—Myalgia, or muscular pain, corresponds to the position of a muscle, and not to the course of a nerve; it is fixed in some definite circumscribed area; it does not usually occur in paroxysms, and is caused and increased by every contraction of the affected muscle; local sensitiveness is only present over the extent of the affected muscle and its tendons. Professor Erb considers that in many cases it is a matter of taste whether the group of symptoms termed *spinal irritation* shall be characterised as such or as neuralgia. The differential diagnostic point lies in the migratory character of the pain in spinal irritation. When the pains, he observes, are limited to a definite nerve, and there is also sensitiveness of one or two spinous processes, we assume the existence of a neuralgia with a well-marked apophysiary point; when the pain wanders, leaping from one nerve-territory to another, whilst the hypersensitiveness to pressure affects first one and then another vertebra, we speak of the case as being one of spinal irritation. This distinction may be of considerable importance in the treatment, and the view is more tolerant than that of Romberg, who speaks of *spinal irritation* as "a fantastic caricature dragged into neuropathology" "by certain English physicians who, to the present day, have failed to achieve a reputation in their native country."

The decision of the question, whether neuralgia is of central or peripheral origin, is one of the greatest importance, because neuralgic affections are in many cases the very first precursors of intrinsic disease in the brain or spinal cord. The recognition of the concomitant phenomena indicating disease of the brain or spinal cord demands the greatest care and the widest knowledge on the part of the physician. Benedict's attempts to determine the seat of a neuralgia, from the character and situation of the pain, are detailed. After a full consideration of this matter, the author observes that earnest endeavours must still be made to extend our knowledge in this direction.

The data upon which the prognosis of the curability and duration of neuralgia in any particular case should be more especially based are principally—the cause and seat of the disease; the particular nerves affected; the age and sex of the patient; the violence and frequency of the attacks, as well as the protracted duration of the whole complaint; and the existence of complications. The manner in which our opinion should be swayed by a consideration of these various matters is pointed out.

Treatment.—The physician who would most successfully respond to the earnest solicitations of his neuralgic patients must be thoroughly acquainted with, and possess a complete mastery over, all the resources for relieving pain, which have, undoubtedly, been increased in number of late years, and at the same time been rendered more precise. Prophylactic measures should be adopted *by those who are predisposed* to the disease. Good diet, abundant and nourishing, is of primary importance, and no apprehension need be entertained that such diet will prove too strong or stimulating. Regular and systematic exercise, as an essential correlate of abundant supplies of nourishing food, is a powerful strengthener of the nervous system. Plenty of sleep; pure fresh air; avoidance of stimulants; restraint of the sexual impulses at any cost, however difficult this may appear in many cases; systematic direction of the mind towards interesting and useful objects of study form the basis of measures which, if thoroughly carried out, will produce satisfactory results. Such nerve-invigorating treatment often strikes at the root of *neuropathic diathesis.* Among *specific remedial measures* there are three groups of remedies that occupy the foremost place in the treatment of neuralgia, as being the most effective—1. *Electricity* in its various forms; 2. The *narcotics*, especially when applied hypodermically; 3. Certain *nervine specifics*, which experience has shown to be useful in many cases. *Electricity* has recently become the most important remedy in the treatment of neuralgia, in consequence of the brilliant success that has attended its applica-

tion in many different forms of the disease, and in no other disease are the results of electro-therapeutical treatment so certainly established as in neuralgia. Of the two kinds of electricity now in constant use, the galvanic current (continuous current) is found to be the more active and applicable to a greater variety of forms of the disease than faradic electricity. Faradic electricity (the interrupted current) is chiefly useful in peripheric neuralgia, when the nerves can be reached by the current, and in cases where no remarkable anatomical change, as neuritis or the like, is present, and thus especially in the so-called purely idiopathic, or "habitual," neuralgia. The *galvanic current* (continuous current) has at least the same action upon peripheric neuralgia, whilst, in addition, it is very effective in the central and deep-seated forms of the disease (spinal and cerebral neuralgias, and neuralgias of the roots of nerves). Moreover, by its "catalytic" effects—that is to say, by its influence on the vessels, upon exudations and the processes of nutrition—it exerts a wide influence on those neuralgias which are uninfluenced by the faradic current. There are two methods of applying *faradic electricity* (interrupted current)—*a*. By conducting a strong current of the secondary spiral, for a few minutes, through the nerve, by means of moist electrodes, one of them being placed on the nerve trunk as near as possible to its central origin; this plan must, for the most part, be frequently repeated. *b*. By producing energetic irritation of the skin with an electric brush, or by means of an electric mona, in the region of distribution of the nerve, at its point of emergence, and over the *points douloureux*. The application of *galvanic electricity* (continuous current) is especially intended to modify the nutritive processes taking place in the nerve, to produce the so-called catalytic effects, and to lower the irritability of the nerves. The results of its application, either according to the polar or the direction method, seem to be equally good. In the polar method the anode (positive electrode) is applied first upon the nerve trunk (when possible in the immediate vicinity of the proper focus of the disease), and then upon the *points douloureux*, and the cathode (negative electrode) upon some indifferent point. In the direction method, the descending direction of the current is used by preference, and the anode (positive electrode) is then to be placed upon the plexus, or upon the roots of the nerve, and the cathode (negative electrode) upon the nerve trunk and the painful points. As a rule, the duration of the sittings should be short, extending over from two to eight minutes, and repeated daily, or every other day. The strength of the current, must in general, be moderate. The effects are usually

experienced at once, and continue for a variable period, from two or three to twenty-four hours, ultimately, after a variable number of sittings, becoming permanent. If, after a moderate number of sittings, as from six to ten, no appreciable benefit is experienced, the case must, in general, be regarded as one not adapted for the electrical plan of treatment.

Narcotics (and *anæsthetics*) constitute palliative means of treating neuralgia that are uncommonly certain and agreeable in their mode of action, and are unsurpassed by any remedies, especially when used subcutaneously. When a decided local action is intended, as is usually the case in neuralgia, the injection should be made as near as possible to the nerve trunk affected, or into the painful point. Injections of morphia are contra-indicated in cases of great debility, in advanced age, hyperæmia of the brain, and organic disease of the heart. *Atropine* alone, of the other narcotics, deserves special mention; it exerts an anti-neuralgic effect similar to that of morphia, and may even prove serviceable when the latter fails. The dose for injection ranges from the one one-hundred-and-thirtieth to the one twenty-second of a grain. Although but little confidence can be placed in the effects of the *external application* of narcotic remedies, we cannot, however, afford to dispense entirely with the use of narcotic ointments and embrocations in ordinary practice, since it cannot be denied that their application is often followed by favourable results. Chloroform may be used in the form of inhalations, or internally, or in the form of an enema, in which both ether and chloroform can be be given in doses of from fifteen to twenty minims suspended in starch paste. Administered in this form, they may be ordered in neuralgia of the sacral plexus or of the pelvic nerves. Although hydrate of chloral may be ineffective in cases of severe neuralgia, its well-marked hypnotic action is useful in many cases, and for this purpose it may be advantageously combined with small doses of morphia, in the proportion, for example, of fifteen grains of chloral to one-sixth of a grain of morphia.

The group of *specific remedies* includes a great variety of remedial measures, some of which have been discovered empirically, and their value demonstrated by experience; others of which are the outcome of physiological researches or pathological considerations. The influence of some of these specifics is undoubted, and has been satisfactorily established by the testimony of excellent observers. In the very first rank amongst specific remedies is to be placed *arsenic*, which acts not only as an anti-periodic remedy in neuralgias of malarial origin, but also as a proper nervine tonic. It is especially effective in cases where there is a general nervous diathesis and imperfect formation of blood. In such cases Fowler's solution

may be given in doses of from three to ten drops three times a day, in gradually increasing doses, or the arsenious acid may be given dissolved in water, in doses of from one-eighth to one-half of a grain per diem, in divided doses. Recently arsenic has been injected hypodermically (Eulenberg), and there are certain advantages in this method of using the remedy. *Zinc*, in the form of oxide, or of valerianate, or of sulphate, if used, must be prescribed in large doses. *Phosphorus* is warmly recommended, especially in anæmic and neurasthenic neuralgias. The preparations of *iron* are of undeniable value in the anæmic forms of neuralgia. The preparation to be employed must be decided by the practitioner, and on this point there is a legitimate difference of opinion—for example, according to Anstie, "the carbonate, in large doses, is the best form, when iron is needed at all;" whereas Erb says, "the carbonate of iron in particular, which was formerly given in such enormous doses, appears to possess no specific action on neuralgia." *Quinine* has a very decided action on neuralgias, even where they are not dependent on malaria. *Strychnia* is highly praised, whether given internally or injected hypodermically, and it may be given combined with the solution of chloride of iron. *Iodide of potassium* proves serviceable in many cases of neuralgia, as in those of chronic rheumatic character, and in very obstinate idiopathic cases. *Bromide of potassium* is extremely valuable, especially in cases where it produces an hypnotic effect. The author coincides with Anstie's opinion of its utility in neuralgia attacking those who, whilst otherwise in good health, exhibit a certain restlessness and irritability of disposition, which is often the consequence of insufficient gratification of the sexual passion, as in women condemned to celibacy; and he observes that but little experience in the treatment of the somewhat more matured women of the better educated classes is required to demonstrate the use of his (Anstie's) practical observations on this point. As in epilepsy, large doses are requisite.—*Dublin Journal of Medical Science, Sept.* 1876, *p.* 211.

18.—THERAPEUTIC VALUE OF HYDRATE OF CHLORAL IN CERTAIN FORMS OF CONVULSIVE DISORDER.

By Dr. CHARLES A. RAYNE, Assistant Physician to the Manchester General Hospital for Children.

In the number of the Lancet for March 13th, 1875, I reported a case of convulsions in a child, under the care of Dr. Acland, at the Radcliffe Infirmary, Oxford, which readily yielded to treatment by hydrate of chloral after failure of the usual remedies, and in which the cure, so far as could be afterwards discovered, was complete and permanent.

The case presented the following distinctive features. The patient, a boy aged five, was of lively and intelligent disposition and of good general health. The attacks followed, and were attributed to a blow upon the head, though it was discovered that entozoa were present in the intestine, the removal of which, however, failed to have more than an incomplete and temporary effect in the cure of the disorder. The convulsions were very frequent, often numbering twenty to thirty in twenty-four hours, but short in duration, and singularly abrupt and sudden both in onset and termination. They occurred both night and day, and were attended with absolute loss of consciousness, and with muscular phenomena which corresponded very closely with such as were artificially obtained by Professor Ferrier on stimulation of certain frontal and parietal convolutions of some of the lower animals.

I have recently had under my care, at the Manchester General Hospital for Children, a case which presents many features in common with the above, and which also yielded to hydrate of chloral treatment after failure of other remedies.

J. A., a girl aged nine, was admitted on May 23rd, with convulsive attacks. These, it is stated, commenced twelve months ago, without known cause, and occurred then to the number of three or four in the day. They disappeared under medical treatment in the course of three months, but reappeared about six months ago with much increased frequency, and though she has since this time been under the care in succession of several medical men in the town, there has been no improvement. Her mother was subject to "fits" three years ago, in which she fell down and lost her consciousness, these occurring two or three times in the day, but disappearing at the end of four months. The rest of the family, which is a large one, are healthy.

The patient is a healthy-looking, well-nourished girl, quick and intelligent in her general appearance and in her answers to inquiries. There is no affection of the heart or kidneys discoverable, nor reason to suspect the presence of entozoa or other sources of internal irritation. The attacks number about fifteen in the twenty-four hours, and occur both night and day, at pretty regular intervals of one to two hours. Several were carefully watched. There is not the slightest aura of any description, the fit coming on at once without warning in the middle of any occupation she may be engaged in. The onset is so sudden that it is impossible to decide what group of muscles is first affected. The attack is limited chiefly to the upper part of the body and is not unilateral. The head is drawn down, and both sterno-mastoids are rigid. Both arms become rigid in semi-extension, and are seized with a tremulous motion. The

facial muscles are unaffected so far as can be seen: the eyeballs are motionless and straight, the pupils being somewhat dilated and conjunctivæ insensible. A groaning kind of noise is made during the time the fit lasts (about one minute), respiration being laboured and rapid, and apparently taking place through a contracted glottis. Recovery is rapid and complete, there being no after drowsiness, headache, or intellectual confusion. From examination during the attack, as well as a careful questioning of the patient, it appears that consciousness is entirely suspended during the attack.

Patient was at first kept quietly in bed, without medicine, with the view of testing the effect of a regulated condition of living. There being no improvement, on the 26th bromide of potassium, in five-grain doses thrice daily, was ordered; on the 29th ten-grain doses, thrice daily, were given, and on the 30th one drachm at a single dose. This treatment had not the slightest effect of any kind; the attacks remained the same in character and duration, and still numbered about fifteen in the twenty-four hours. Tincture of belladonna was then given in five-minim doses every six hours, and was increased on June 1st to eight minims. The fits now numbered from fourteen to eighteen in twenty-four hours, and were unaltered in character and duration.

June 3rd. Patient took eight grains of chloral hydrate at 5 p.m., and had no fits during the next seven hours (about the length of time in myself of a sleep produced by the drug, and which perhaps is connected with its period of elimination from the body). There was no sleepiness after the chloral. From midnight to 10 a.m. there were seven fits. Always sleeps well at night.

5th. There has been no further dose of chloral given, and the patient has had in the last twenty-four hours twenty-three fits, which brings up the average for the two days to fifteen again. Ordered five grains of the chloral twice daily, at 10 a.m. and 4 p.m.

8th. Has had five fits each day, and these occurred always during the night hours, from 11 p.m. to 5 a.m., except on the 7th, when there was a fit in the daytime, evidently due to disturbance caused by a small dose (one drachm) of castor oil, for it occurred half an hour afterwards, and on this day the fits numbered seven in the day. Ordered five grains every six hours, commencing at 10 a.m.

12th. Has had from three to four fits each day, all occurring in the early morning hours from 1 to 6 a.m. The night doses at 10 p.m. and 4 a.m. ordered to be increased to ten grains. Always sleeps well at night, notwithstanding the fits.

21st. Up to the 16th patient had one or two fits each night,

but since this time there have been none. Ordered five grains of chloral at 10 p.m. and 4 a.m.; none during the day.

25th. There has been no fit. To stop the chloral altogether.

July 10th. There has been no return of the fits since June 16th, and patient is discharged apparently in every way healthy.

Remarks.—These two cases present several points of great interest.

1. The muscular phenomena were almost identical in each, with the exception that in one they were unilateral, in the other bilateral, and therefore there was not in the latter that turning of the head and eyeballs fixedly to one side so observable in the former (*vide* report), though the muscles of each side were rigid. In both cases it is highly probable that the seat of mischief was in certain motor centres situate in the cerebral cortex, in the convolutions bounding the Sylvian fissure, as described in greater detail in my former paper; these are supplied by a large branch of the middle cerebral artery, which courses through the very centre of the disturbed district. It is here, according to the experiments of Prof. Ferrier and others, that the centres for the movements described are situated, and it is interesting in this connexion to note the instantaneous and absolute loss of consciousness in each case during the attack—not only in that in which the disturbance must have affected both sides of the brain, but also, as far as could be ascertained at least, in that where it was limited to one side.

2. In both cases the administration of bromide of potassium was absolutely without effect. There can, I think, be now no doubt, since the researches of Ferrier and others, that motor centres exist in the cerebral cortex itself (as well as in the spinal cord and its prolongations to the base of the brain), which stand in more immediate relationship to the organs of will and intelligence. And it would appear that over these higher motor centres bromide of potassium is entirely without control, and in convulsions there originating it is valueless—that its sedative and controlling powers are, in fact, limited to the centres in the spinal cord and basal ganglia. It is difficult to conceive of any reason for such strange selective power where the conditions appear so similar, but the domain of therapeutics abounds in similar instances. It is interesting to observe that in cases of convulsion where bromide of potassium so often acts as an invaluable curative agent, and which on other grounds may be supposed to originate in the base of the brain, or especially the upper part of the cord, consciousness is not always lost or even necessarily affected at all, and where it is so it is probably due to a "nerve storm" of so wide a range as to affect secondarily the higher centres.

3. In both cases the effect of hydrate of chloral was immediate and most marked, and at first there was a distinct relationship between the number of the fits and the time of their occurrence and the amount and time of administration of the chloral. This may perhaps be taken as an additional argument for the cortical origin of the disturbance, judging from the known power of the hydrate to control the higher centres, as shown in producing sleep, whilst the bromide has no such *direct* effect. It is a point of considerable interest to determine the action of the chloral in cases of disturbance originating indubitably in the lower centres; this I have not yet had an opportunity of doing. The mode of action is probably that by its sedative effect on the irritated nerve-centres it gives the opportunity for rest required to recover tone and nutrition, and to break a "bad habit."

4. The greater liability of the fits to recur in the early morning hours during bodily rest deserves a word of mention as having a therapeutic bearing. This may be due in some measure to fasting and consequent lessened nutrition, but is more likely to depend upon the fact that the normal channels for distribution of nerve-force in muscular action are for the time more or less closed, and the force thus pent up has a greater tendency to discharge in abnormal directions. If this be so, it need scarcely be pointed out that to keep a child suffering from an affection of this kind quietly in-doors or in bed is the worst of all treatment, and that benefit will be likely to accrue from the promotion of active exercise.—*Lancet, Aug.* 26, 1876, *p.* 287.

19.—ON THE PROGNOSIS OF CEREBRAL HEMORRHAGE.

By Dr. JULIUS ALTHAUS, Physician to the Hospital for Diseases of the Nervous System, &c.

[Apoplexy is the most fatal of all the diseases of the nervous system, carrying off year by year more victims than either paralysis, epilepsy, or insanity.]

In spite of its frequency and importance, the anatomical and clinical features of cerebral hemorrhage have only of late been more accurately ascertained. The old ideas about its being due to the rupture of an atheromatous blood-vessel are still found in the text-books; and many highly significant symptoms, which are not only of great pathological interest, but also of considerable value for determining the prognosis of the affection, are not yet familiar to practitioners, from attention not having been sufficiently directed to their occurrence and meaning.

I have, on a previous occasion, fully gone into the anatomical part of the subject; and I will, therefore, now only remind you that cerebral hemorrhage may take place—

1. *By rupture of the large cerebral arteries*, such as the middle cerebral and basilar, after these have undergone aneurismal dilatation.

2. *By rupture of the capillary vessels*, which is generally caused by injury to the head, either direct or by contre-coup; but also occurs in the course of that chronic inflammation of the grey matter which is found in some forms of mental disease; and may be consequent upon embolism and tumours which grow in the cerebral substance and corrode the coats of the blood-vessels. It is also occasionally observed in leukæmia, where it is owing to accumulation of white corpuscles in the capillary vessels, which thus gradually become distended, blocked up, and ruptured.

3. *In consequence of contracted granular kidney*, which leads to blood-poisoning, and consequent over-action and hypertrophy of the coats of the arterioles, and hypertrophy of the left ventricle. In cases where the hypertrophy of the coats of the cerebral arterioles is not sufficient to counterbalance the excessive impulsive force of the left ventricle, cerebral hemorrhage from rupture of these arterioles may be the consequence.

4. By far the most important form of cerebral hemorrhage, however, is that which occurs by rupture of the cerebral arterioles, after these have undergone the change known as miliary aneurismal dilatation. *Miliary aneurisms* were first described by Virchow; but their frequent occurrence, and their importance for the pathogenesis of the common form of cerebral hemorrhage, was first pointed out by Charcot and Bouchard. It is this latter form, which occurs in the immense majority of cases of what is commonly called *apoplexy*, and constitutes a disease of itself, which has special clinical and pathological features. To be able to make a reliable prognosis in such cases is quite as important for the physician as it is to treat them; and this is absolutely impossible without knowing what significance to attach to certain symptoms, which, by their presence or absence, or their degree of intensity, will serve to render the prognosis hopeful or the reverse.

A most important element in the prognosis of apoplexy is *time*; and although a number of cases only prove fatal on the fourth or fifth day after the commencement of the symptoms, either from collapse or from cerebral fever, yet it is the fact that, the longer the attack lasts without death taking place, the more hope there is for recovery, as far as life is concerned.

In cases which are to end fatally early, that is, within twelve hours from the commencement, you will be guided in your prognosis by the high degree of intensity of all the symptoms of apoplexy. Amongst these, I would direct attention, foremost of all, to those signs which are given by *thermometric*

observation; and you should never be without your clinical thermometer at the bedside of such a patient. Quite in the commencement of the attack, and particularly where the hemorrhage is not abundant, the temperature remains normal; but, after ten or fifteen minutes, the thermometer in the rectum or the arm-pit shows signs of falling. Respiration may still be quite regular, and the pulse may beat quietly at the rate of 70 or 76, yet you will see the mercury receding to 97 deg., 96 deg., and even 95 deg. Where this fall takes place rapidly, and reaches the lowest degree just mentioned, the prognosis is bad; while, if the fall is only slight, say one degree or one and a half, and is protracted in its production, the prognosis is generally favourable.

What is the cause of this considerable fall of temperature? Bourneville and Charcot, who were the first to point out these changes, are quite silent on this point. I believe that we must look upon this fall as a symptom of irritation or spasm of the controlling centres of heat production; and that it has the same clinical significance as convulsions and rigidity of the muscles of the extremities, and conjoint lateral deviation of the head and eyes, which are also prominent and significant symptoms of the apoplectic seizure. Where there are severe convulsive attacks, lasting for many minutes, and where the head and eyes are persistently turned away from the paralysed side, you may conclude that the hemorrhage is progressing more or less rapidly, and that the blood is irritating and undermining the central ganglia, previously to its destroying their texture.

During this period of the attack, you have, therefore, partly symptoms of spasm and partly of paralysis—spasm where there is irritation, paralysis where there is compression or destruction of nervous matter. Consciousness and speech are at first impaired, but, after a time, lost; the energy of the special senses, and of common sensation, is diminished and gradually vanishes. A strong light, loud sounds, powerfully smelling or sapid substances, no longer convey any impressions to the anæmic brain, and the patient cannot be roused by any of the usual modes of reviving consciousness. The face is distorted, and its expression utterly vacant; the pupil dilates; reflex action appears abolished, and the urine and fæces are voided involuntarily. The sphincter ani does no longer offer any resistance to the introduction of a finger or an instrument. The automatic movements of circulation and respiration, which at first continued much in the same manner as they do during a heavy sleep, become affected in their turn. Inspiration is short, superficial, and irregular,; the soft palate is heard to flap to and fro, producing stertor; and, from having been accelerated, respiration becomes retarded and intermittent. Mucus accumu-

lates in the air-passages, and laryngeal, tracheal, and bronchial *râles* are heard. A frothy liquid, which is a mixture of saliva, buccal mucus, and air, is seen to run down the chin. The pulse is large, hard, and incompressible, more especially in the carotids—not from congestion, as has been erroneously supposed, but from the resistance encountered by the current of the blood, which cannot enter the intracranial blood-vessels, compressed as they are by the effusion.

Patients have occasionally recovered after presenting all, or nearly all, of the severe symptoms just mentioned; and none of them are, therefore, of the same prognostic importance as a great fall of temperature.

After a time, which varies from thirty minutes to thirty-six hours, the spasm in the centre ceases, either from the hemorrhage being arrested, or from the blood breaking through into the lateral ventricles and into the fourth. The symptoms then become purely paralytic in their character; the lateral deviation of the head and eyes disappears; convulsions and rigidity cease; and the body heat begins to rise more or less rapidly. Where this rise is extensive, it has the same unfavourable meaning as the fall in the commencement; and the mercury, now at 103 deg., 104 deg., or even 105 deg., corresponds in prognostic significance to the low readings of the first period. More especially where the temperature runs up rapidly, it is a sure sign of collapse, which is soon followed by death.

On the other hand, we find cases in which the thermometer, after a comparatively slight fall, rises only little, if at all, above the normal mean, but remains stationary at 98 deg, or 99 deg. This means that the hemorrhage has been arrested; the opening in the miliary aneurism having been, as it were, sealed up by contraction of the clot, before the blood could have broken into the lateral ventricles. There is, therefore, now only a comparatively small cavity filled with blood, which may be expected, in course of time, to undergo its appointed changes. There is no lateral deviation of the head and eyes, no rigidity or convulsion of the limbs; the body does not appear so completely relaxed as before; the difference between the sound and the paralysed side—if there be paralysis—becomes more marked, one being quite relaxed, while the other offers some resistance on being moved, or carries out semi-voluntary movements; the patient begins to talk again in a dreamy fashion, and the coma gradually lightens into consciousness. The pulse becomes steadier, and respiration more regular; although the contraction of that side of the diaphragm which corresponds to the paralysed side is more feeble than that of the other side.

The prognosis in this stage, which may last for two or three

days, still remains doubtful; for although the patient has escaped death from collapse, he is still liable to be carried off by the consecutive cerebral fever, which, in cases that are to end fatally, is apt to come on after the partial recovery just described has taken place. You have to be particularly careful, at this period of the malady, not to give too favourable an opinion about the prospects of the patient, for blame may be attached to you if you pronounce the patient out of immediate danger, and he die the next day of cerebral fever.

At this time, when the patient's fate hangs, as it were, in the balance, nothing will assist you more in forming a correct view of his condition than an *inspection of the nates;* for the first symptom of cerebral fever is almost invariably acute bed-sore in the buttock of the paralysed side.

An erythematous spot, or macula, appearing on the second, third, or fourth day on the part just mentioned, almost invariably heralds a fatal termination of the case; for this change in the nutrition of the skin and subjacent parts shows paralysis of the trophic intracranial centres, which precedes paralysis of the volitional centre only by a short time. The pathology of the process is the same as that of ulceration of the cornea after section of the fifth nerve. The cerebral macula has an irregular shape and varies in size; from being pink at first, it gradually changes into purple. Pressure will cause it to disappear, showing that there is only hyperæmia in the beginning. Probably at your next examination of the parts, you will notice a great change; for rapidity of progress, a superacute course, is characteristic of this affection. The hyperæmia is succeeded by effusion of serum, and phlyctænæ are formed, which contain a liquid that is at first colourless, but shortly becomes sanguinolent and livid. The raised cuticle then gives way, and an open sore is left, which has a scarlet surface, and appears covered with livid granulations. Gangrene is now fully established, and, if the patient survive long enough, inflammation sets in, by which the gangrenous parts are to be eliminated.

This acute bed-sore is quite different from that which occurs habitually, in consequence of prolonged pressure on the back and other parts, in the course of protracted disease, where the patients are bedridden, and where there is frequent involuntary evacuation of the urine and fæces, which aids in the production of gangrene. Charcot, who has studied this condition more particularly, has found that it cannot be prevented by turning the patient over to the non-paralysed side, so as to avoid pressure on the buttock of the paralysed side; nor by frequent catheterism, whereby any contact of urine with the surface is avoided. Moreover, the bedsore which occurs in protracted

cases of spinal and other diseases, affects more the sacrum than the buttock, which constitutes another difference between the two.

In some cases, appearances similar to those just described are observed on the heel, ankle, and knee of the paralysed leg; and where the effusion has burrowed its way into the lateral ventricles, phlyctænæ may appear on both nates.

A rise in the temperature may be expected with certainty after the cerebral macula has begun to form; and the mercury will, in a comparatively short time, run up to 103 deg., 104 deg., and even 105 deg. At the same time, othes symptoms manifest themselves which point to the impending dissolution. The patient throws himself about in a restless manner, and a low muttering delirium sets in, which is occasionally broken by loud moanings. The pulse becomes small and compressible, and runs up to 120 or more beats. Respiration is hurried and superficial, at the rate of 40 to 60 in the minute; and the abdomen is drawn in during inspiration, showing commencing paralysis of the phrenic nerve. The extremities become cyanotic, and completely relaxed. The face, and sometimes the whole body, is bathed in clammy perspiration; the neck is flabby, and the head will retain any position in which it is placed. Pulmonary complications sometimes set in a short time before death, and the temperature occasionally reaches its maximum shortly after the fatal issue.

Treatment may incline the balance towards recovery or death. The treatment by venesection, which was formerly much in favour, was thoroughly irrational, and generally followed by disastrous results; indeed, many patients have died of the remedy rather than of the disease. Venesection has lately fallen into disuse: but as it is still recommended in some text-books for this condition, I wish to impress upon you most strongly the fact, that the condition of the brain during cerebral hemorrhage is not one of congestion, as was formerly believed, but of anæmia; that the organ not only loses blood largely, but is also, from compression of its arterioles through the clot, unable to receive a fresh supply of the reviving fluid; that death in this disease takes place chiefly from anæmia; and that, by resorting to phlebotomy, you simply increase cerebral anæmia still further, and thereby hasten the fatal result. *Eschew the lancet, therefore, as a deadly instrument in these cases.*

A simply expectant plan of treatment is recommended by the most recent writers on the disease; and there can be no doubt that abstaining from all active interference is far better than to bleed your patient. Molière, on his death-bed, cried out to his doctors: Laissez-moi mourir, mais ne me tuez pas!" and the expectant plan of treatment certainly does not kill the

patient, it only allows him to die. In spite, however, of recent authorities for doing nothing, a more active mode of treating cerebral hemorrhage seems to me to be called for.

Your object must be to arrest the further effusion of blood from the ruptured coats of the miliary aneurisms, by causing the vessels to contract. Now, many styptics must be inapplicable for these cases, because the patient cannot swallow, and even if medicines were introduced into his stomach, it seems most doubtful whether they would be absorbed. Nor can the rectum be used for the purpose of affecting the circulation, as there is frequently paralysis of the sphincter ani, and inability of the bowel to retain its contents. The hypodermic mode of administering medicines seems, therefore, to recommend itself, particularly in these cases; and the remedy I think most appropriate for them is ergotine.

There are two kinds of ergotine known to chemists, viz., Wiggers's and Bonjean's. The former is insoluble in water, ether, and dilute acids, but soluble in alcohol, strong acetic acid, and caustic potash; and, on account of these peculiarities, it is not suitable for subcutaneous injection. Bonjean's ergotine, on the other hand, is easily soluble in water, and it is this therefore which you should use. I am in the habit of injecting a grain of it every hour, or, where the symptoms are very urgent, even every half hour, into the subcutaneous cellular tissue; and although the experience of a single observer, in a disease like the one now under consideration, cannot count for much, yet I feel justified in recommending you to follow this practice, as being likely to save many lives.—*British Medical Journal, July* 22, 1876, *p.* 101.

20.—ON THE PATHOLOGY OF THE PNEUMOGASTRIC NERVE.

By Dr. S. O. HABERSHON, Senior Physician to and Lecturer on Medicine at Guy's Hospital.

The pneumogastric nerve in the abdomen is brought into the closest relationship with the solar plexus and semilunar ganglia of the sympathetic nerve, and it is very difficult to separate the pathological changes incident to the one from those which have their origin in the other. The par vagum reaches not only to the stomach, but to the liver, to the duodenum, to the suprarenal capsules, and to the kidney; and it unites with the phrenic nerve as the branches of the latter pass through the diaphragm. Although the pneumogastric is especially distributed to the muscular coats of the stomach and regulates its movements, still it has sentient branches, and when these are

irritated pain is produced; neuralgic pain at the stomach may be due to the disturbance of this nerve as well as of the sympathetic nerve. Romberg describes gastrodynia neuralgia as due to hyperæsthesia of the pneumogastric nerve, and neuralgia cæliaca as traceable to hyperæsthesia of the solar plexus. Irritation of the nerve will not only produce pain and muscular contraction, as hour-glass contraction, but vomiting, and this of several kinds; as well as altered secretion, and sometimes perverted sensation, as craving appetite. When the nerve is weakened or paralysed, another set of symptoms is observed, and we have loss of appetite, anorexia, and distension of the stomach.

The *vomiting* produced by cerebral disease is often of the most decided character, and it is of the greatest importance that the nature of the malady should be correctly understood. To treat the stomach while the irritation is at the cerebral extremity of the nerve, is often the greatest injury to the patient. The bilious attacks of early life are very frequently to be traced to cerebral disease, and are too often overlooked till the true character of the disease is unmistakably indicated. It is not, however, every form of acute disease of the brain which induces this irritation of the pneumogastric nerve, but especially those cases where the base of the brain or the floor of the fourth ventricle is implicated. In an instance of acute meningeal inflammation in a muscular young man in Guy's Hospital, the stomach was so exquisitely sensitive, that if water, milk, or any fluid were swallowed, it was at once ejected with such violence that it was projected beyond the foot of the bed. After death, there was found a collection of pus in the meninges of the brain, directly pressing upon the pnuemogastric nerve at its exit from the brain-substance at the medulla.

In *tumours* of the brain, especially at the cerebellum, the vomiting is often of the most marked character; it comes on independently of food, the tongue may be clean, and the bowels in a normal condition, but still food is rejected at regular intervals, and especially in the morning; sometimes several days may elapse between the periods of vomiting. At times, this is the prominent symptom of commencing disease of the brain, but in other cases it is associated with severe pain, and with affection of other nerves, as the optic and olfactory; with giddiness and intolerance of sound, or with epileptiform convulsion. I have narrated a deeply interesting case of this kind in the Guy's Hospital Reports of 1874, and, in the last clinical session under my care, a child, about twelve years of age, was admitted quite amaurotic with one eye, and with the other she could only distinguish day from night. The symptoms had come on a month previously, with severe vomiting and pain in

the head; the pupils were widely dilated, but there were no febrile symptoms. The condition appeared to indicate organic disease of the brain, such as tumour, and the prognosis was a very unfavourable one; but, under the steady use of perchloride of mercury with iodide of potassium, the symptoms entirely disappeared. The vomiting had ceased previously, but the amaurosis gradually lessened, at first in one eye, then in the other; and she was seen to be amusing herself, then nursing a doll, and soon afterwards an infant patient in the ward.

It is scarcely needful to refer to the vomiting, which is one of the earliest, although most insidious, symptoms of *tuberculosis* of the brain and its meninges in early life. It is often ascribed to a bilious attack, till severe convulsion comes on, or the child has severe pain in the head, or is noticed to become listless and indifferent to its ordinary amusements; as effusion takes place and coma comes on, this irritable condition of the stomach ceases, but it is often reproduced if the recumbent position of the patient be changed. The pupils, at first small and irregular, become dilated and insensible; the abdomen is often contracted; the respiration is also irregular and sighing, and the skin sensitive to cold. The capillaries, losing their tonicity, easily yield to sudden pressure or blow, and again become overcharged—the *tache cérébrale*. This irritable condition of the stomach, however, does not always exist in tuberculosis, for many instances of tuberculosis occur in adults where vomiting is absent. These cases closely resemble enteric or typhus fever, and are only recognised by close observation of the temperature and general symptoms.

The same action upon the pneumogastric is observed in *direct injury* to the brain, as in severe concussion, and it is a noticeable symptom in ingravescent apoplexy; a minute vessel gives way in the brain, and the first effects are those of sudden disturbance, as in concussion, severe pain in the head, faintness and pallor, with vomiting; then, as reaction follows, further effusion of blood takes place, and the worst symptoms of apoplectic effusion of the brain are produced. It is the greatest mistake, and often very disastrous, to treat this faintness with ardent spirits; to stimulate the action of the heart increases the subsequent effusion, and renders what might otherwise be a partial injury of brain-tissue into a destruction of most important organs. The apoplectic clot breaks through into the lateral ventricle, and, reaching to the fourth ventricle, exerts direct pressure upon the origin of the respiratory and other nerves.

Disturbance of the cerebral centre of the pneumogastric may be produced by *over-anxiety of mind and distress*. A junior partner in a large commercial house had vomiting every morn-

ing; he had no pain at the stomach, the tongue was clean, the bowels regular or relaxed, the pulse compressible; there were no intemperate habits or dissipation to induce this morning sickness; the meal was taken, but in a very short space of time rejected. It was evident that the irritability of the stomach was not due to disease of that organ; and, on making inquiry, it was found that the patient had had a fall from his horse some time previously, and the fear was entertained that organic disease of the brain had commenced. Mercantile collapse came at length, the heavy clouds of disaster broke, and when a more healthy state of money affairs was obtained, then the cerebral disquietude also ceased.

Again, we find the same irritation of the stomach produced by *epilepsy* and commencing *insanity*. The epileptic paroxysm may entirely cease, but may be replaced by attacks of nausea and vomiting, with epileptic vertigo. It is difficult to define the precise condition of the brain in these cases. The cerebral disturbance, whether anæmia or other atonic change, is sufficient to produce, not a loss of consciousness, but a transient affection of the pneumogastric nerve; in the same manner, some epileptics will describe a sensation passing over them without loss of consciousness, sometimes affecting sight, sometimes the hearing, or general sensation; in these cases, it is at the cerebral origin of the pneumogastric that the gastric disorder originates.

These symptoms are sometimes very peculiar, and the following may be taken as an example. A gentleman, aged 49, whose father was epileptic, was brought to me by his medical attendant. The patient was nervous and dyspeptic, and troubled with flatulence; he had a choking sensation as if he could not swallow, and became very uneasy. The heart's action occasionally irregular; the pulse was compressible and irritable, but there was no evidence of any organic disease; the tongue was pale and flabby, and he complained of pain at the back of the head; the countenance was not expressive of distress, but the patient said the pain was intense. It was evident that the branches of the pneumogastric were especially affected, and that the malady was connected with disorder of the nervous system, and did not arise from organic mischief. It was not one, but several branches of the nerve that were involved; and sometimes one, sometimes another, was affected.

In another, a gentleman aged 42, whose brother died of phthisis, had attacks of intense nausea, which came on every two or three months during seven years; the attacks, he said, amounted to "agony." He had a distressed countenance, and a sense of fulness of the head; the appetite was poor, and the bowels confined; there was aching, or rather increased sensi-

tiveness, in the spine; the abdomen was relaxed, and nothing abnormal could be felt. The recti sometimes became rigid; the urine was of specific gravity 1020, and was free from albumen and from sugar. This patient was relieved by the injection of morphia, but more effectually by strengthening the nervous system. Sometimes nervous twitchings came on in these patients, as if a slight epileptiform convulsion; in others, the excessive irritability of the stomach is followed by melancholia.

Closely connected with these instances are others of persistent irritation of the mucous membrane of the stomach; the vomiting is constant, and continues every day year after year, till the patient is emaciated to the last degree. These cases are different from the irritable stomach which is found in hysteria, in chlorosis, and in uterine disease—the hysterical stomach—as it has been called; to these we shall have to refer presently. At first, there may have been some local or peripheral disturbance, some dysmenorrhœa, or affection of that kind, to originate the disease, but that soon subsides, and leaves a condition of great nervous exhaustion; still the symptoms may be worse during menstruation, because the weakness is greater. The food is rejected from the stomach almost at once, it may be without pain; but, in many instances, there is soreness at the scorbiculus cordis; there is no hemorrhage, or only of the slightest kind; mucus is rejected, and patients often refer to this as the cause of the disease. The tongue is often clean, or nearly so; the bowels are inactive; neuralgic headache is often complained of. In many cases, these patients are said to have organic disease of the stomach, ulceration, or even malignant disease; the reduction of strength may be extreme; and ordinary remedies fail to lessen the irritation. It will generally be found that those remedies are most effective which lessen nerve-exhaustion; and few are better than very small doses of ammonio-citrate of iron, alone or given in a state of effervescence; sometimes nux vomica does good, and even arsenical compounds may be used with advantage, and it is of great importance to give some kind of vegetable food. Mistakes are often made in the entire abstinence from vegetables for lengthened periods; the system becomes weakened thereby, and I have seen severe scurvy produced.

The vomiting which is produced by *uterine disease* and by pregnancy is too well known to need even mention, but that which is a symptom of early *ovarian disease* is often overlooked. There may be no pain in the region of the ovary, no enlargement there, and the gastric symptoms may be so decided as to mislead experienced practitioners. I was called to see a lady in consultation who had vomiting a few hours after food; the

vomiting was not constant, but irregular; still the emaciation was decided and progressive, the abdomen was not distended, it was free from pain, and the pylorus could be felt. This led to the opinion of organic disease at that part; the irregularity of the vomiting, however, induced me to believe that this might not be the case, and I could not consent to the decided opinion of malignant disease being present. This lady was about fifty-five years of age, and menstruation had ceased for several years. She went into the country, and whilst there, all the gastric symptoms ceased, but the abdomen began to swell; she returned to town with evident symptoms of ovarian dropsy. I requested that my friend Dr. Oldham would meet me. She was tapped, and Mr. Spencer Wells afterwards removed successfully a large ovarian cyst. Very similar are those cases of gastric trouble in young married people, where conception has not taken place, but where there is reflex action and sympathetic disturbance from ovarian and uterine irritation of the pneumogastric nerve. These instances are often misunderstood, because menstruation continues regularly, and it may be, without pain. The gastric branches in this way become exceedingly irritable, and vomiting is a troublesome and harassing symptom; sometimes it is almost constant, at other times only on slight nervous excitement, or over fatigue; the excitement of going into company, or of mixing in society, may be quite sufficient to bring on severe vomiting. Of the same kind is the troublesome vomiting present in young people, with scanty or disordered menstruation and chlorosis. The food is rejected at once, almost as soon as it reaches the stomach, but without much distress; there may be scarcely any pain, and some of these patients appear to be plump and well nourished. This condition has been aptly called the "hysterical stomach," and certainly the condition is one of functional irritability. Some food is retained, for the body is not wasted; the bowels are generally confined; the pulse irritable; the abdomen often fairly distended; with this state, there are other indications of nervous excitement. The determination of the patient may do an immense deal to restrain this condition, and in a young hospital patient the cure was effected by the nurse refusing to bring anything into which she could vomit. The occupation of the mind, fresh air, chalybeate tonics, free action on the bowels by aloetic and assafœtida purgatives often relieve this state. The steel may be given with advantage in a state of effervescence; in other instances, however, it is necessary to allow the stomach to rest entirely, and to feed the patient by nutrient injections. If the uterine and ovarian functions be disordered, these must if possible, be rectified; and in the instances of married women, to which we have referred, it is often of great value to lessen

pelvic irritation by opiate suppositories. It is of little use to treat one symptom while the cause of disturbance remains.—*British Medical Journal, May* 27, 1876, *p.* 651.

21.—THE REFLEX FUNCTIONS OF THE SPINAL CORD.

By Dr. WILLIAM STIRLING, Demonstrator of Practical Physiology in the University of Edinburgh.

Dr. Marshall Hall has the undoubted merit of being the first (earlier than Johannes Müller, as is acknowledged by the latter himself) who investigated most widely and thoroughly the vaguely known phenomena of movement consequent upon stimulation of peripheral areas of the body; who employed the principle of reflexion from the sensory to the motor nerves through the medium of the central parts of the nervous system; and who, by the discovery of many new facts, indicated the meaning of numerous phenomena in their connexion with other nervous actions, which were, until his time, falsely explained. In his paper in the Philosophical Transactions, M. Hall develops the following peculiar view:—He thought that the phenomena of reflexion are limited to the spinal nerves, and do not include the nerves of special sense connected with the brain. Reflexion is not brought about by sensation, not even by sensory nerves, but by special nerves,—the "excitomotory," which conduct the impression, and the "reflectomotory," which cause the reaction. In the mixed nerves these two sorts of fibres are mingled with the sensory and motor nerves. The tonus of the muscles and the closure of the sphincters are maintained by the reflexion of the spinal cord. The reflex movements are as different from the voluntary ones as from those of muscles alone, and form a class by themselves. J. Müller points out that Hall's theory differs from that of Whytt as well as from his own. In the first place, M. Hall limits the phenomena of reflex action to the spinal nerves, and denies to the cerebral nerves of special sense the power of exciting them. He supposes the reflex motor action to be in no case excited by sensation, not even by means of the sensitive nervous fibres. He maintains the existence of special nerves, or nerve fibres, endowed with the excitomotory function; and the reflex action he supposes to be conveyed, not by the nerves of spontaneous motion, but by special fibres, which he calls "reflectomotory." Grainger was a warm supporter of this doctrine. M. Hall did not found his excitomotor nervous sytem upon the same grounds as led Spies to a similar hypothesis, but because he regarded the psychical and the reflex functions as so very different, that he could not imagine them as occurring in the same way. Beyond this, a special system of fibres seemed to him to be necessary for the reflex processes, for the

greatest reflex action does not seem to belong to those parts which are most richly supplied with sensory nerves, and because reflex movements can occur through the spinal cord without consciousness, and after the removal of the brain. Volkmann shows how improbable is the hypothesis of M. Hall, for every piece of skin of the size of a needle-point would require two specifically different fibres—one for sensation, and another for reflex action; and, as Kürschner remarks, just as for a reflex motor action, so also for the discharge of movement by volition or emotion, special fibres are necessary. "It is therefore obvious that, in carrying out Hall's principle, the number of specific fibres in all probability would be so great, that the small nerve fibres would not be able to contain them all."—*Edinburgh Med. Journal, April* 1876, *p.* 918.

22.—A CASE OF EXTREME PLUMBISM TREATED BY GALVANIC BATHS.

By S. J. KNOTT, Esq., Medical Superintendent of Galvanism to St. Mary's Hospital.

I think this case one of great interest from the way it defied all drugs and yielded at once to the galvanic bath.

Samuel S., aged thirty, a cab-washer, admitted June 22nd, 1875, under the care of Dr. Sieveking. There is a family history of phthisis. He has led a very intemperate life. For the last three months he has noticed he was losing flesh. A week before admission he had been drinking freely during the day, and sleeping at night in an omnibus, when he took cold, which was followed by an attack of delirium tremens. On recovering from this it was found he had lost the use of his upper extremities and his voice. He says for the last three years he has had the very first glass of beer and gin served in the morning—*i.e.*, the liquor which had remained all night in the draw-pipe in contact with lead, at a public-house he frequented. During this period he has had colic three or four times. On admission he complained of pain in, and distension of the abdomen; the bowels were constipated, not having been moved for five days; the margin of the gums was fringed with a well-marked blue line. The man was wonderfully emaciated; if placed in the erect position he fell over in any direction if not supported, and he had not the slightest command over the flexors or extensors of upper or lower extremities, especially the upper, which seemed to have ceased to act at all. The deltoids seemed entirely gone, the head of the humerus could be traced in the glenoid cavity quite plainly, his ribs were covered only by skin; in fact, he looked more like a dried skeleton than a living person. The voice was just audible. Sensibility was good all over.

The heart and lungs were normal. The tongue was coated with a thick, brownish yellow fur, and the patient perspired rather freely. He was put to bed and ordered an ounce of castor oil immediately, and a soap enema four hours after.

June 23rd. Has passed a very restless night, trying to get out of bed. Bowels acted freely; temperature 99° F. Since his admission his urine has been collected and examined by Dr. Wright, the lecturer on chemistry, which gave $\frac{1}{3400}$ of a grain of lead per fluid ounce. And some of the gin and beer which he drank every morning for three years was also tested by Dr. Wright, and lead was found in both, especially the gin, which contained $\frac{1}{430}$ of a grain of lead per fluid ounce.

28th. Still has restless nights. Appetite pretty good; bowels open; urine scanty; perspiration free; voice a trifle better. Temperature 100·2°. Ordered ten grains of iodide of potassium in an ounce of infusion of quassia three times a day, and twenty-five grains of chloral hydrate in an ounce of water at bedtime; to be faradised daily in upper extremities.

30th. Faradisation commenced to-day. The ordinary Stohrer's two-celled battery put on at full power did not cause any of the muscles of the arm or forearm to act in the slightest. Bowels open; pulse 100, small; temperature 101·2°; slight cough, with some frothy mucous expectoration.

July 2nd. Sleeps better at night now, without the chloral draught. Cough troublesome. Temperature 99°; pulse 124. Repeat mixture of iodide of potassium. Faradisation continued, but does no appreciable good at present. Has a good deal of twitching after it in the arms, probably from irritation to the sensory nerves only.

6th. The same.

9th. His general health is improved. Pulse 120; temperature 98·5°. Cough better. There is a slight attempt to swing the arms.

12th. The same. Arms to be galvanized first, and faradised after.

29th. Is a little better in his general health, but the paralysis is as intense as ever. He continued to be galvanised and faradised, and to take the iodide of potassium, from this date up to the 3rd of December, with hardly any benefit. Dr. Sieveking then kindly allowed me to have a thorough trial of galvanic baths.

Dec. 4th. To-day, for the first time, he was placed in a warm bath 85°, and the water charged with 28 cells of the continuous current battery. At first the current was passed from the positive pole placed at the nape of the neck, to the negative at the feet. After ten minutes of this the negative pole was moved about along his arms, &c., and he was kept in the bath twenty

minutes. Said he felt the galvanism a very great deal more in the water than when applied in the ordinary way.

17th. Has had the bath every day since he commenced; can now swing the arms freely and flex them pretty well; he can also walk with but little help; says he feels much stronger and better; has a constant irritation all over him in the skin for ten or twelve hours after the bath; bowels, which were constipated before, are now quite regular; urine much increased in quantity; appetite very good; is certainly gaining flesh. To leave off all medicine and to have a pint of beer a day, with ordinary diet.

27th. Is wonderfully improved; has gained several pounds in weight; his ribs are getting covered with flesh; can only bear eighteen cells now of the battery; complains of great irritation of the skin, with tingling, after the bath; sometimes it is so great as to wake him at night; can walk quite strongly now without any help, and can almost dress himself without help. To have bath only three times a week now.

Jan. 3rd, 1876. Is looking quite well—in fact, except for a little weakness in the forearms, there does not appear anything the matter; can put either hand on top of head or on opposite shoulder. He continued in the hospital till Feb. 25th, more from kindness than necessity, as he was hardly in a fit state to return to his arduous work—washing thirty or forty cabs during the night. He came four or five times to see me after he left, and the last time he came he told me he had been driving a pair of ponies.

Remarks.—It is with great pleasure that I publish this case, as I think it well worth the attention of my professional brethren, who like to see the advance of medicine in any form. Here was a man whose health was completely undermined by the slow poison of lead, having sustained an enormous loss of muscular fibre, and who was placed under the usual treatment, which was persevered in from the 22nd of June to the 4th of December, with but slight benefit. He was then placed under the galvanic-bath treatment, and from the first of these baths the patient began to have new sensations, showing the immediate action on his system. From this time he continued to improve, and not only so, but he seemed to undergo a perfect regeneration of muscular fibre. On the shoulder, where there was formerly nothing but skin, gradually a new deltoid appeared to form. More than this, the fourth bath given to him was acidulated, to increase the strength, and he was placed in it the usual time, twenty minutes. Dr. Handfield Jones kindly took a gallon of the water, tested it, and found well-marked traces of *lead* in it. After this the water was prepared in the same way (without the man being placed in it), and was then tested

with a negative result. If, then, lead can be removed, in fact extracted, from the system, why not mercury, arsenic, &c. ? I have no doubt the man has been going on well, or he would have returned, for he was greatly pleased, and always ready to have his bath. I may add further, that cases of ordinary lead colic and dropped wrists which have been treated by this method have recovered in a few days, without any medicine.—*Lancet, October* 14, 1876, *p.* 531.

DISEASES OF THE ORGANS OF CIRCULATION.

23.—PROF. LEBERT ON THE VARIOUS FORMS OF ANÆMIA, AND THEIR TREATMENT.

By Dr. W. BATHURST WOODMAN.

The April number of the Archives Générales de Médecine contains an article by Professor H. Lebert on the varieties of anæmia or dysæmia, with especial reference to the form which he calls essential or idiopathic. It is an expansion of the chapter on this subject in his Handbook of General Pathology and Therapeutics, of which he has recently published a new edition in Germany. He objects to the term "oligocythæmia" as expressing but a very small portion of the truth, for anæmia is much more than a mere diminution of the red corpuscles. The composition of the blood is altered, though as yet chemistry has told us but little of the changes; the distribution of the blood is altered, and so is the innervation of the vascular system. Dysæmia would be a far better term, but he retains the old name of anæmia, as generally known and adopted. We may distinguish different forms by such terms as "spoliative," when it results from losses of blood, or of lymph, or of any secretions or excretions; "inanitive," when it arises from insufficient nourishment; "destructive" *(consomptive)*, when the elements of the blood are consumed faster than they can be made, as in fevers of long duration; there is a dystrophic form when nutrition is profoundly altered, as in cancerous affections, tubercular diseases, chronic nephritis of different kinds, and forms of chronic poisoning. Anæmia may be termed "neurotic," when it results from a modified action of the nerves on the circulation and formation of the blood, as in chlorosis and essential or idiopathic anæmia.

Except as regards the lessened number of red corpuscles, organic chemistry has taught us but little of the changes in the blood in anæmia. No doubt there are difficulties in the way of analysis; and for one thing, anæmic patients can ill support venesection which would be required in order to analyse blood. As regards the red corpuscles, there are slight

forms in which they vary between 110 and 100 per 1,000, and a more severe form in which they are lessened to 65 per 1,000 (Andral), or even less. Andral and Gavarret mention even as few as 28 per 1,000 in human beings; and in sheep they have seen as few as 15 per 1,000 parts.

In average cases it is rare to find the red corpuscles diminished below half the normal number, except perhaps temporarily after very large and sudden losses of blood. The buffy coat met with in such cases is no proof of inflammation; on the contrary, it increases just in proportion to the poverty of the blood. This was pointed out by Burserius long ago. Lebert does not approve of any distinction being made between acute and chronic cases, for he has seen the one pass into the other. At present we have two great categories of cases of anæmia: one class, of which the causes are well known and quite definite; another class in which the causes are only known very imperfectly, or remain quite unknown. To the first class belong the spoliative anæmias, whose causes and symptoms are easily recognised. Amongst these we have losses of blood, losses of lymph, and loss from excessive and prolonged secretions or excretions. Anæmia from starvation also falls into this category, and then we may include the cases in which there is a consumption of the elements of the blood more rapid than their production, as in febrile diseases of long standing.

Amongst the forms of anæmia whose causes are either known imperfectly or are quite unknown, we must include chlorosis and essential or idiopathic anæmia, and perhaps also the forms of anæmia, in which there is cachexia. Class I. includes the impoverishment and alteration of the blood from definite causes, and Order I. spoliative anæmia, with diminution of corpuscles.

a. Anæmia from Lymphorrhage, or Excessive Flow of Lymph. Professor Lebert has described the dilated condition of lymphatic vessels, their varices, and the excessive flow of lymph in some cases in Virchow's Pathology (Virchow, Pathologie et Thérapeutique Spéciales, 2nd ed. vol. v. p. 666). He has seen cases in which it was possible, by pricking one of these varices, to obtain a small continuous jet of lymph—and thus to study the character of this fluid. These lymphorrhœas or lymphorrhages may occur spontaneously and repeatedly, and on each occasion such quantities of lymph may be poured out that great and severe anæmia may be the result. One of Fetzer's female patients lost at one time 3½ large glasses of lymph, or about 1,750 grammes, or nearly 57 ounces. Lebert observed a loss of this kind, which lasted nine hours. In a case of Desjardins', frequent losses of lymph lasted ten or twelve hours each time, and on one occasion for forty-eight hours. Whilst a student, Lebert saw a curious case of this kind, in the summer of 1833 in Schönlein's

wards. The patient had every six weeks a loss of lymph from varicose lymphatics in the scrotum, which furnished on each occasion some 500 grammes, or nearly 18 ounces of lymph. From this he became pale and anæmic. This loss of lymph had been mistaken for an abnormal secretion of milk. Lebert discusses the symptoms in this form, and shows that they are analogous to those produced by hemorrhage—especially hemorrhage from the uterus.

b. Anæmia from Hemorrhage or Loss of Blood. As this form is familiar to English readers, we need not follow him in the details of this class. The concluding paragraph is, however, worthy of note. He points out that there is a class of case, in which, either from the spontaneous cessation of the hemorrhages or from their cure by surgical means, as for example in piles, and uterine polypi (myomata), the patients appear to be perfectly cured, after very large losses, and do indeed regain the external appearances of health, if looked at carelessly, but when we study them more closely, we find them remain for many years still feeble, easily fatigued, irritable, and an easy prey to disease of various kinds. Lebert's second order of spoliative anæmia from loss of secretion, by albuminuria, &c., including as it does anæmia from excessive secretion of milk, which he thinks rare; loss of albuminous fluids in chronic diarrhœas, and loss of albumen in the urine, prolonged sweating, prolonged suppuration, and the like, may also be dismissed, as familiar to English medical men.

c. Anæmia from Insufficient Nourishment or Starvation.—His remarks on this head are founded chiefly on the observations of Chossat, C. Schmidt, and Voit. He remarks with truth that schools, prisons, workhouses, and other public institutions afford a large field of study, in regard to this variety, to the practitioners of medicine. So do those diseases which cause dysphagia, whether they are the result of accident, as when caustics are swallowed, or proceed from cancer, tumours, or other morbid conditions. Cases of refusal to swallow food, of indigestion, and the like, are next discussed. Cases of cancer and cancroid tumours of the œsophagus, are complicated by the cachectic effects of the malady on the general system. So again, in phthisical ulcerations of the epiglottis, the effort to swallow is followed by regurgitation, and the patient is thus discouraged and hastens his own end by inanition. Cases of chronic poisoning by lead, mercury, and arsenic, are somewhat obscure as regards the etiology of their anæmia. The poison seems to attack the very sources of blood-formation, and of these we really know very little. Can we say that we know more about the causes of poisoning by marsh-miasmata? Lebert thinks not, for it exceeds what we might reasonably

expect from the disordered digestion, and the disappearance of a certain number of red corpuscles in the spleen and the subsequent melanæmia do not sufficiently explain it. The anæmia consequent on disease of the heart and great vessels may be a trifle plainer, but is still obscure. Nor does chronic alcoholism appear to owe its anæmia to the effects of alcohol on the digestive organs alone. However, it is worthy of note that the anæmia in cases of chronic alcoholism is never so great as we observe in many other morbid states, for example, in cases of cancer.

Class II. Includes impoverishment of the blood from unknown causes. Under this heading we get chlorosis, and essential or idiopathic anæmia.

a. Chlorosis. People fancy they know all about this, because they are content to define it as a diminution of the red corpuscles, and of the iron in the blood. It was surely a happy instinct which led physicians to call this disease chlorosis, rather than anæmia. Almost all pathologists now admit the nervous element in these cases. There is no direct proportion between the percentage of the blood-discs and the functional troubles of chlorosis. Moreover, it often seems to arise when the hygienic conditions are favourable, and is by no means confined to the poor. Causes of spoliation are usually absent. We must therefore conclude that the formation of the blood is at fault. Why, we know not. Possibly the white corpuscles are formed in less quantity, or they are not transformed into red ones. We talk of nervous influence, but the real nature of this is unknown. The relative smallness of the heart and great vessels, invoked by Virchow, may apply to certain cases, but scarcely to the numerous and happy instances of cure which we see. What a strange state of anæmia is that, in which we see our patients pale and feeble, and out of breath after some trifling exertion, yet able to dance half the night without serious harm, or take long walks when the excitements of pleasure and contentment come to their aid! It is doubtful whether iron really effects most of the cures. Ferrugineous mineral waters are, no doubt, useful; but there are other ingredients. Quinine and arsenic appear of great service in the neuralgic forms. Hygienic and moral treatment—or, as Lebert well puts it, both physical and moral hygiene—are as necessary as drugs, or even more so, in the treatment of chlorosis.

b. Essential or Idiopathic Anœmia.—Lebert prefers this name to that of "progressive pernicious anæmia," under which Biermer, Gusserow, Ponfick, and Zimmermann have described this disease. Essential simply implies that the causes are unknown. The more he studies the disease, the more difficult does it appear to be to find a common cause. Biermer and

others have maintained fatty degeneration of the heart as the common property of such cases. But it was only present in two out of three of our author's fatal cases, and cases equally serious have ended in recovery. Fatty heart, again, may be present without this severe form of anæmia. Further, he objects, so long, at least, as the recorded number of facts is small, to include a prognosis in the appellation of the disease.

The proclivity or preference of this form of anæmia for pregnant or recently delivered women was first observed by Lebert in 1853. He vindicates his claim to priority, or at least very early publication, by referring to the published reports of the medical department of the canton of Zürich for 1853, and from a French journal he quotes the following *verbatim*. "We have three times observed a peculiar chlorotic condition, hitherto undescribed—acute, febrile, and supervening quickly after delivery. The absence of any definite organic lesion, and the presence, on the other hand, of the clearest symptoms of chlorosis in women who have scarcely lost any blood at all in their labour or after it, cause us to look on this condition as a chlorosis due to the puerperal condition. One of our patients had general anasarca, without any albuminuria, and without any signs of Bright's disease. These three women all got well in from three to six weeks, under treatment by tincture of malate of iron, of which thirty to fifty drops were taken twice daily." In the German text he called it "acute puerperal chlorosis," but he admits that "acute" is an ill-chosen term, because this condition appears to be developed during the pregnancy in some cases. Brief notes are given of these three cases. One was a woman, aged thirty-three, in good health till her fifth pregnancy. During this she had slight symptoms of anæmia. A few days after delivery (in which she lost hardly any blood, and the labour itself was natural) alarming symptoms of severe anæmia set in. When admitted to hospital, sixteen days after the birth of the child, there were no signs of organic disease, but she had a quick pulse, hot skin, and a hæmic bruit. The urine (s. g. 1017) appeared perfectly normal. For many weeks she remained in a restless, sleepless, and dangerous condition, spite of all treatment. But after rather more than two months she improved, and left the hospital in another month greatly better. There is in these cases a real rise of temperature, not easy to account for. Lebert notes the same in several cases of hæmatemesis, in which the temperature long remained above 99·5° Fahr., and even above 100·4° Fahr. The second case, in 1853, of this anæmia was in a pluripara, aged twenty-nine, a cotton-spinner. Her symptoms began in the third month of her third pregnancy, but were not alarming till three or four weeks after apparently natural labour withour hemor-

rhage. Her state continued alarming till nearly three months had elapsed. After observing three more cases, in 1854, Lebert again drew attention to these cases in his reports of the medical department for that year. Again he published a fatal case in the Wiener Medicinische Wochenschrift (1858, no. 34 "Ueber essentielle Anämie.") This patient was only aged twenty-four. She had been married five years. She had had one child before, and the last labour, ten weeks before admission to hospital, was apparently quite normal. The lochia were rather scanty. There were, however, several attacks of epistaxis, short, and of no great severity, yet they seemed to greatly exhaust her. There were no signs of organic disease. She had a quick pulse (108-120); rapid breathing; hot, dry skin; extreme pallor of skin and mucous membranes, and all the rational signs of extreme anæmia, including the usual nervous symptoms. In spite of all treatment, she died fifteen weeks after her labour, in most complete collapse. All the viscera, even the brain, were extremely anæmic; the blood in the cerebral vessels, and indeed everywhere, was paler than it should be (pale red, or pale brown). The large vessels everywhere were nearly empty. There were scarely any clots or blood in them, or in the heart. The liver was somewhat enlarged. The heart's substance was pale and soft (fatty?) Other cases are reported by Lebert in his reports 1867, and in the Vienna journal quoted above. In a male patient, aged forty-five, a linen-weaver, the necropsy showed extreme anæmia of all the organs, some leucine and tyrosine in the lungs, and in the liver, which was slightly fatty. The heart's structure was healthy. The kidneys contained some inosite.

In a fatal case in a woman, aged fifty-five, besides extreme anæmia of all the organs, there was some fatty degeneration of the heart (and liver also), and the aortic valves were a little atheromatous. There was fluid in the pericardium, in both pleuræ, and in the peritoneal cavity.

The favourite age in the female is twenty to thirty years, but one woman, just mentioned, was fifty-five. The three men were aged thirty-nine, forty-four, and fifty years respectively.

Lebert thinks it not unlikely that there is a special neurosis of the great sympathetic, like the tachycardia exophthalmica of Basedow (Graves's or Begbie's disease). But at present this is mere theory. In remarking on the treatment of anæmia and its causes, Lebert insists on the folly of adopting round-about and antiquated methods of stopping hemorrhage, when we can do this by direct methods such as the ligature of arteries, or the removal of tumours or similar methods. He inveighs against the "diète absolue," more common in foreign hospitals than in our own; he insists on the importance of

artificial feeding in some cases, of rest, of change of air, the use of quinine (of which he prefers the muriate), arsenic, iron, especially the malate or pomate, of change of air, of cheerful society, and sometimes of good wine. In young females, he gives baths, and even bromide of potassium; in many cases of dyspepsia and chlorosis he finds alkaline and effervescent waters of use. A mixed diet is essential and scientific. Moral treatment in many cases is more appropriate than the rage for restoring iron to the blood.—*London Medical Record, July* 15, 1876, *p.* 289.

24.—ENDOCARDITIS TREATED BY SALICINE.

By Dr. GEORGE PARKER MAY, Maldon.

When in the neighbourhood of his residence, on May 14th, I was called to visit J. H., aged 45. He stated that he had been ill two or three days, after exposure to the east wind, with general pain in the joints, cough, and uneasiness in the chest. He now complained of a sense of weight and oppression all over the chest. He had cough, with some viscid expectoration. The skin was hot, bedewed with perspiration; pulse 124; urine scanty, high coloured, with intense acid reaction. On the 15th, the symptoms were aggravated. He had pain under the sternum, going through to the left shoulder, with occasional palpitation, general pain in the joints, but no articular swelling visible. He had been entirely unable to lie down during the night. Perspiration was profuse, the countenance expressive of anxiety. Cough was frequent; pulse 124; temperature 102 deg. There was no abnormal cardial dulness or friction-sound. A strong blowing murmur was heard with the first sound, heard most distinctly at the apex; the second sound was undistinguishable. There were moist bronchial *râles*, especially on the right side of the chest. Salicine in scruple-doses was given every four hours, in a mixture of glycerine and water. On the 16th, he said he felt better, and that he found relief from the first dose of the medicine. The anxiety of countenance was less apparent. He had been able to sleep a little, with his head and shoulders much elevated. The endocardial murmur was less pronounced; pulse 106; temperature 100 deg. The perspiration was less; the cough was still troublesome; the bowels were regular. He was ordered to continue the salicine. On the 17th, he had been able to lie down a short time, and had obtained a little sleep. The dyspnœa was much less; pulse 90, regular, and compressible; no palpitation; temperature 99 deg. There was a blowing murmur with the first sound, distinct over the apex, but not so harsh; it was gradually lost towards the base. Salicine

was given every six hours. On the 19th, he was in every respect better. From this date his improvement was progressive and uninterrupted; and on the 24th he was able to walk a few steps in his garden.

This patient had a severe attack of acute rheumatism about four years ago, since which he had been subject to occasional rheumatic pains, but insufficient to interfere with his occupation. The salicine gave rise to no irritation of the mucous lining of the throat, which is frequently the result of the administration of salicylic acid.—*British Medical Journal, June* 17, 1876, *p.* 752.

DISEASES OF THE ORGANS OF RESPIRATION.

25.—ON THE TREATMENT OF EMPYEMA BY LISTER'S ANTISEPTIC METHOD.

By Dr. E. MARKHAM SKERRITT, Physician to the Bristol General Hospital.

There have been, I believe, not more than three or four cases recorded in which Lister's antiseptic method has been applied to the treatment of empyema; and I cannot but think that its more extended use would result in substantial evidence of its value. My object in relating the details of this case is to call attention specially to the antiseptic treatment of this disease, and to point out what appear to me to be its peculiar advantages.

The patient was a boy, eight years of age, admitted on December 1st, 1874, into one of the children's wards in University College Hospital, under Dr. Sydney Ringer, who has kindly placed the notes of the case at my disposal. During the month of October previously, pus had been twice withdrawn from the left side of the chest by aspiration, with much temporary benefit. On admission, the ordinary signs of left pleuritic effusion were well marked; the heart's apex was at the epigastrium, the side was enlarged and dull throughout, and mucous *râles* and weak breath-sounds were faintly audible. Evening temperature, 98 deg.

Next day, December 2nd, I inserted the aspirator-trocar in the sixth interspace in the anterior axillary line, and withdrew twenty-eight ounces of greenish yellow sweet pus. The apex of the heart came back to its normal position, the breath-sounds returned, and the boy was much relieved. The evening temperature was 98·4 deg.

In two or three days, however, the temperature became irregular, and examination of the chest showed that fluid was reaccumulating: and on the 23rd, three weeks after the previ-

ous aspiration, the heart's apex was to the right of the ensiform cartilage, and the whole left side was again enlarged and dull on percussion. On that day, I removed thirty ounces of pus by aspiration, and the heart returned to its normal position.

The boy was much relieved, but it was soon evident that the pleural cavity was filling again, and symptoms of hectic became marked; on several occasions there was a difference of about 4 deg. between the morning and evening temperatures, the highest temperature being 104·2 deg. on the evening of the 31st. By January 6th, the heart's apex was again to the right of the epigastrium, and the side was as full as ever.

Accordingly, on the 9th, at Dr. Ringer's visit, the patient was put under chloroform, and I inserted a drainage-tube in the sixth interspace in the anterior axillary line, letting out about twenty-eight ounces of pus. The operation was performed strictly according to the antiseptic method, and the usual dressing was applied. For several days, the free discharge of pus necessitated the change of dressing morning and evening; but the amount of discharge rapidly decreased, and for the next week one dressing a day proved enough. After that, for the next sixteen days, the dressing was changed every other day only. As the discharge had now become very scanty, from this time to the removal of the drainage-tube on March 9th, the side was dressed once in every three or four days only. On the 17th, the wound had completely closed.

Thus the patient was cured in a little more than two months; and I believe that, in our anxiety to avoid the opposite error, we kept the drainage-tube in too long, and thus prevented the wound from closing before. During this time, the boy had been improving rapidly, gaining in flesh, and strength, and spirits; the symptoms of hectic disappeared directly the free opening was made; and from that time the temperature gradually fell, till, on the removal of the tube and the closure of the wound, it came down to normal.

I believe I am speaking in accordance with general experience, when I say that we have no evidence to lead us to hope that the absorption of pus from the pleural cavity can be obtained by any internal use of drugs or external applications alone; and nature herself indicates, by the establishment of fistulous communications with that cavity, that the fluid must be removed by some other way than by absorption. As it, therefore, seems that we cannot expect to cure empyema without effecting the escape of the fluid by operation, the question arises, What method is to be adopted in any given case for the removal of the fluid, and what line of after-treatment will give the best results?

There are two ways in which the fluid may be evacuated.

The first is, by such means as to limit the escape of pus to the time of the operation—the object being to prevent the entrance of air, and so guard against decomposition in the cavity.

The case that I have related illustrates what is well known—that tapping alone cannot be relied upon to effect the cure of empyema; the aspirator had been used four times in three months, each time with marked temporary benefit; but the repeated reaccumulation of fluid and the gradual onset of hectic, indicated that recovery, if it took place at all under this mode of treatment, would be very protracted; and that it was impossible to say how often the tapping might have to be repeated before that end was attained, and how great might be the drain upon the patient's system owing to the long-continued suppuration.

My experience, however, would not lead me to coincide with the opinion expressed by some writers of authority, that the *only* cure for empyema is a free opening. There have been a sufficient number of cases recorded to show that tapping alone may be successful; and this, as would be expected, is especially likely to be the case in children, in whom I have repeatedly seen recovery follow the use of the aspirator.

The *second* way in which the fluid may be evacuated is by the establishment of a fistulous opening in the chest-wall. It is to the mode in which this may be done that I wish specially to direct attention.

The method that has usually been adopted is to make an opening into the pleural cavity, through which pus and fibrinous coagula and caseous masses may freely escape, while no attempt is made in any way to alter the character of the external air which enters the cavity at each inspiration. A drainage tube is generally inserted to keep up the communication. In some cases, no local after-treatment seems necessary, and there may appear to be no great harm done by admitting air freely into the cavity. It would seem that many cases do well thus. But there are other instances in which, as a result of the communication with external air, there follow all the evil effects of the presence of putrid pus in the cavity, and its absorption into the blood; the temperature rises, and the symptoms of the septicæmic state follow in varying degrees of intensity. In these cases it is found necessary to wash out the pleura with some disinfecting solution, in order to keep the cavity sweet.

Trousseau gives the details of a case of empyema treated by injections, which he plainly considers evidence in favour of this method. The patient, a girl, six years old, was cured at last, after free suppuration for a year and eight months; as he himself says: "In this remarkable case, purulent effusion three times neces-

sitated recourse to paracentesis; perforation of the lung took place; a solution of iodine was injected more than two hundred times, and there were nearly as many chlorinated and aromatic injections used; in the end, however, the cure was complete. Let me draw your attention to the extraordinary amount of the purulent secretion, which may be estimated at a daily average of two hundred *grammes* (about eight ounces) for about two hundred days, which is the enormous total of forty thousand *grammes* (more than eighty pints)." He very pertinently adds, "you can understand how essential was constant and copious nourishment to enable the child to struggle with this prodigious drain upon the system."

The question somewhat naturally arises, What effect upon the process of suppuration had all these more than four hundred injections? What would be the effect on any open suppurating wound of the diligent application of irritating washes? The idea cannot but suggest itself, that there may have been some association as cause and effect between this most diligent use of irritating solutions and the free and prolonged suppuration. And yet it was essential to keep the cavity sweet.

What does this process of washing out entail, both to patient and to doctor? Either once or twice every day, the performance has to be gone through; there are the necessary preliminaries of arrangement of macintosh and various receptacles, and of the patient himself in a certain position with relation to these accessories; then follows the injection of the fluid, either through the drainage-tube or through a catheter, introduced with more or less pain to the patient; now and again the irritation of the pleura excites cough, which sends a volley of mingled injection and pus through the opening, to the discomfiture of the medical man, if experience have not taught him the precaution of "standing out of the line of fire." After all this, the patient and his surroundings have to be made clean and dry from the effects of both the injection and the cough.

Evidently this process, repeated once or twice every day, must have an injurious effect upon a patient whose condition is probably one in which it is important that all sources of disturbance, of local irritation, and of consequent exhaustion, should be carefully guarded against.

During the course of treatment, it will probably happen at intervals that, in spite of the injections, the discharge will putrefy in the pleura, or that some decomposing pus will be temporarily retained; when this occurs, the elevated temperature and the general condition of the patient will at once indicate the absorption of poisonous matter; and immediate removal of the cause of the mischief is necessary.

In these cases, where a free vent for the pus is imperative, and where the ill effects of decomposition in the pleura have been manifested, we have had to decide between two evils; the evil of letting the patient alone, and the evil of adopting a mode of treatment that is disturbing and exhausting to him, and a source of irritation, and probably of increased suppuration as regards the pleura itself. As, however, the former evil is by far the greater, we have had to put up with the latter.

The problem is, therefore, set before us: How can we allow free exit to discharges, and, at the same time, prevent decomposition in the pleura? I believe that Professor Lister has found the solution of this problem for us in his antiseptic method.

To return to the case I have brought before you. Within three months more than ten pints of pus had been withdrawn from the chest, and the rapid reaccumulation of fluid, together with the onset of hectic, made it evident that there was no tendency to that speedy cure of empyema that sometimes takes place in children. The drainage-tube was then inserted antiseptically, and the details of the after-treatment were carefully carried out. The discharge, at first profuse, rapidly diminished, and in about two months the boy was practically cured. His general condition had, meanwhile, undergone the most marked improvement. There was no decomposition of the pus throughout.

What amount of disturbance did the treatment entail upon the patient? Simply the removal of the old dressings under the spray, and the substitution of fresh. No pain was given to the patient; at no time was it necessary to use any injections into the cavity, and there was no evidence of any irritation of the pleura. Thus the physical and moral disturbance of the patient was reduced to a minimum.

Contrast this with the treatment by injections that I have before described, and the result is surely favourble to the antiseptic method.

Again, whilst the injections have to be persevered in once or twice every day, the intervals between the antiseptic dressings gradually lengthen as the discharge decreases; at first, the dressings must be renewed twice a day, soon only once, then every other day, then once in two, three, or four days. The frequent repetition of *injections* is unavoidable, owing to the *rapidity of decomposition;* whilst the *antiseptic dressing* is renewed only when the *amount of discharge* makes it necessary—decomposition being excluded from consideration.

It appears to me that the antiseptic method is especially applicable to the treatment of empyema; in this disease, the conditions are much the same as in chronic abscess, as, for example,

psoas abscess. In both the course of the disease is more or less chronic—in both there is a large suppurating surface, communicating with the external air by a small opening only, and it is specially easy, by the use of antiseptics, to guard this small opening against the entrance of the excitors of putrefaction, whatever they may be; in both, the large extent of internal surface and the small vent for discharges, make the presence of putrid matter proportionally dangerous; and in both will the antiseptic treatment ward off the constitutional disturbance that the absorption of septic matter is well known to produce, and which too often ends in the exhaustion and death of the patient.

To sum up: in all cases of empyema, where it is necessary to establish a fistulous opening, I strongly advocate a fair trial of the antiseptic treatment. To the objection, that many patients do well without any use of injections, I reply that, in a given case of empyema, it is impossible to say what will be the course of the disease after the opening is established—whether cure will be effected without any further local treatment, or whether a long course of injections will be needed; and that it is prudent to adopt that method which, while benefiting the simplest cases, will place the most severe under the best conditions for recovery.

The advantages of the antiseptic treatment are these.

1. A free discharge is allowed.
2. Decomposition and consequent absorption of the products of putrefaction are prevented.
3. The treatment is very much less disturbing and exhausting to the patient, both because the process itself is much simpler, and also because it is less frequently repeated.
4. There is no irritation of the pleura.
5. One, and perhaps the chief, cause of sudden death during the after-treatment is avoided.

In a word, by the application of the antiseptic method to empyema, we are enabled to secure all the advantages of a free opening, without any of its disadvantages.—*British Medical Journal, July* 22, 1876, *p.* 109.

26.—FREE INCISION *VERSUS* THE ASPIRATOR IN EMPYEMA.

By Dr. ANTHONY BELL, Senior Assistant Surgeon to the Newcastle-upon-Tyne Infirmary.

Having always held a strong opinion regarding the vast importance of a free incision in empyema, and having treated several cases successfully by this line of treatment, perhaps a brief history of my last three cases may not prove uninteresting.

I have never lost sight of my patients, and, upon inspection last October, found them in perfect good health.

Case 1.—M. A., aged 19. On February 15th, 1869, I met his medical adviser in consultation. The patient had suffered from an attack of pleurisy of the left side. He was propped up in bed and gasping for breath. His pulse was 144; he was much emaciated, and troubled with a short dry cough. The left side was dull on percussion; the heart pushed to the right side. An exploring needle revealed pus. A free incision was made into the pleural cavity. No drainage-tube was required. The cavity was not syringed. The wound was poulticed; and it closed in about two months. The weight of the lad when he first went out was 7 stones. In October 1874, his weight was 11 stones 11 pounds.

Case 2.—Mr. W., aged 34, stated that he had been under treatment for a period of six months, and that his illness commenced with a severe pain in the left side, accompanied by cough and difficulty in breathing. He was emaciated and extremely weak. His weight was 8 stone. The whole of the left side of the chest was dull on percussion, and the heart was pushed to the right of the sternum. An exploring needle revealed pus. A free incision was made into the pleural cavity, and over 40 ounces of pus were evacuated. The cavity was daily syringed with warm carbolic lotion; no drainage-tube was required. The wound was poulticed, and the opening closed three months afterwards. In October 1874, his weight was 10 stones.

Case 3.—On May 18th, 1874, I visited Mr. O., aged 36, and found him suffering from a smart attack of pleurisy of the right side. He was being treated by his medical adviser by hot applications, which were contined by myself. With my utmost efforts I failed to arrest effusion and produce absorption. On July 15th, he complained of shortness of breath and troublesome cough, with profuse expectoration. He was much emaciated, and suffered from night-sweats; pulse 104; temperature 98.3 degs. On inspection, I found the right side almost stationary. The intercostal spaces were flattened and somewhat widened; but there was no perceptible enlargement of the right half of the chest. Upon percussion, there was dulness in front from the liver to a little above the nipple, and behind from the liver to within an inch from the spine of the scapula. There was absence of respiratory murmur, vocal resonance, and vibration. The infraclavicular space of the same side was resonant, and there the respiratory murmur was harsh. The left side was normal. The aspirator-needle was inserted between the seventh and eighth ribs, and over 30 ounces of thick laudable pus were withdrawn. Great relief was afforded by this operation. A dose of chlorodyne was then given.

On July 16th, the pulse was 100; temperature 102.2 degs. He stated he could breathe with his right lung.

On July 17th, chloroform was administered, and a free incision made at the site of the puncture into the pleural cavity. More than 20 ounces of pus without odour were evacuated. A pad of tenax was applied. The chlorodyne was repeated.

On July 18th, the pulse was 100; temperature 98 degs. There had been no cough nor difficulty of breathing since the first operation. The cavity was syringed night and morning with warm carbolic lotion.

On July 20th, the opening seemed to be closing too quickly, consequently, a drainage-tube was inserted. Tenax was substituted for the poultices, as it was found lighter and cleaner.

On July 21st, there was a free discharge from the tube.

On August 7th, the patient was up. His weight was 8 stones 5 pounds.

On August 28th, only a little serum exuded from the tube in the morning.

On September 18th, he went down to the home.

On September 28th, the tube was removed. The wound then closed, and healed in three days, In October 1874 his weight was 10 stones 11 pounds. His weight in March 1875 was 12½ stones.

[Mr. Bell forwarded with his paper photographs of all three patients, taken in October 1874. The men were evidently at that time in good condition. In each case, the skin was puckered in at the site of the healed opening into the pleura; which, in every instance, was just below the anterior margin of the axilla, between the seventh and eighth ribs; and so situated, that the nipple of the same side lay about midway between the cicatrix and the middle line of the sternum. In Cases 1 and 2, the puncture was made into the left pleura; in the third case, the opening was on the right side of the chest. The side which had been diseased seems at that date to have been no smaller than the opposite healthy side; and, altogether, upon paper, the results appear highly satisfactory.]—*British Medical Journal, July* 22, 1876, *p.* 112.

27—CASE OF PLEUROPNEUMONIA FOLLOWED BY EMPYEMA; TREATED FIRST BY PARACENTESIS, THEN BY INCISION OF THE CHEST.

By Dr. C. S. Ticehurst, Bishop's Waltham.

[In this case, which was that of a young woman 28 years of age, it became dangerous to delay the operation of paracentesis in consequence of the great amount of the effusion. An aspirator was therefore used, with great but only temporay relief. Five pints of pus were withdrawn by its means.]

Dr. Butler saw the patient with me. We had resolved, at our previous consultation, that, should interference again become necessary, we would open the pleura, according to the plan recommended by Dr. Bowditch, of Philadelphia. Accordingly, I made an incision between two and three inches in length, between the ninth and tenth ribs, in a line with the inferior angle of the scapula down to the pleura, on opening which over six pints of inodorous pus escaped. A piece of lint was placed in the wound, and a large linseed-meal poultice applied over it, into which the pus drained, and which had to be frequently changed. The relief to all the urgent symptoms was at once apparent. It was noticed, as after the tapping, that the heart, although, to a certain extent, it was freed from its unnatural position, was not back in its place. A capital night was passed after the operation; and on the following morning all pain had gone, and the chills and perspirations had also ceased. The temperature (as will be seen) was 98.1 deg., the pulse was 97, and the respirations were 24.

June 8th. The discharge had become very offensive. The cavity was washed out with Condy's fluid and water. There was already a considerable improvement in the patient's condition.

From the day of opening the chest, the patient slowly, but surely, progressed towards recovery. The bed-sores disappeared, as also the aphthous condition of the mouth. Flesh was gained, and it soon became difficult to satisfy the craving for food. The local treatment adopted was to wash out the cavity every other day with Condy's fluid; but, as its deodorising effect did not last long, tincture of iodine (one part to twenty parts of water) was soon substituted, from the time of using which not the slightest unpleasantness was perceptible either in the room or on dressing the wound, although a quantity of pus was continually discharging. Nothing could have been more satisfactory. This plan of treatment was continued for six weeks, and then there was evidence of iodine absorption in a severe rigor, high temperature (103.7 deg.), and sickness, which soon, however, passed off. For a time or two, water alone was used, and the washings out were finally discontinued the fourth week in July, at which period not more than a drachm of thin seropurulent fluid was discharged during the twenty-four hours. On August 14th, in the tenth week after the operation, the wound was allowed to heal up, there having been no discharge for some days, whilst the temperature had been normal for a fortnight.

At this time, the left side was markedly distorted, the ribs touching one another all the way down. There was still dulness, commencing from below mamma and passing round into

the axilla, which was probably due to a layer of lymph lining the chest-wall. Air could be heard entering the lung to a fair amount. Strength was soon gained, and the patient went away to the sea-side. On her return, a few weeks later, the improvement was great in every respect, especially in the gaining of weight; for, at my request, she had been weighed every week.

In November, the distortion, which was so noticeable in August, had gone. Instead of the ribs lying in contact, as above described, the intercostal spaces were well marked, and the side moved fairly well during respiration. The dulness remained about the same, and on auscultation plenty of breath-sounds were heard over the lung, which were slightly harsher than those on the right side. The general health was excellent; walks of some length were taken without much fatigue being induced, and scarcely a trace was shown of the severe ordeal through which the patient had passed.—*British Medical Journal, July* 22, 1876, *p.* 106.

28.—ON THE OPEN AIR TREATMENT OF CONSUMPTION.

By Dr. JAMES BLAKE, San Francisco, California.

An article in the British Medical Journal for October 24th, 1874, recalls an intention I have had for some time of sending a communication on the open air treatment of consumption, a plan I have advocated for many years, both on the grounds to which Dr. Marcet alludes as to its being a septicæmia, and also on account of the advantages which such a treatment offers for improving the digestive organs. In a paper published in the San Francisco Medical and Surgical Journal, in 1860, I pointed out the advantages to be derived to the digestive functions by living in the open air; but looking at the septicæmic element of the disease, no other treatment it appears to me, can so effectually combat it as living in the open air, the only condition in which a patient with diseased lungs can avoid rebreathing the poisoned air he has expired, laden with the germs for intensifying the putrefactive processes going on to his lungs. There is undoubtedly a germ of truth in the theory of Dr. Mac Cormac of Belfast, that the chief cause of consumption is rebreathed air, but not, I think from its being overcharged with carbon, as he supposes, but because it is loaded with a much more subtle poison in the putrefactive germs which it contains. Some twelve years ago, I published some cases in the American Journal of Medical Science, showing how many cases of consumption had been arrested, and some cured, by what I called the open air treatment of the disease; and a longer experience has convinced me that this method offers the

best chance for our consumptive patients. But, before the profession can be induced to employ it, I am aware that an accumulated mass of prejudice has to be removed, not only amongst physicians, but more particularly amongst the public, as regards the evil of exposure and living in the open air. The idea of advising a patient in the third stage of consumption, suffering from cough and night-sweats, to sleep in the open air, is a proposition which in England, I am aware, would be considered not only as dangerous, but almost as a sign of lunacy. Even here, where it is no very uncommon thing for persons to sleep out of doors, and where the dewless nights of our mountain ranges during our rainless summers render any covering but blankets and a tree quite superfluous, I often met with objections to following such a course. And yet I am convinced that it is the best method that we possess for arresting and curing consumption. In England possibly, and in fact in most parts of Europe, the occasional summer rains and the absence of dry mountain ranges, with their pine-covered ridges, offer obstacles to such a treatment being fully carried out; but the principle once recognised, a great deal may be done even there towards employing it. In order, if possible, to remove to a certain extent this prejudice, I would state that I have never in a single instance seen any ill effects result from it. I have sent out patients to sleep in the open air who were so far reduced that they could not even ride on horseback, but had to be conveyed in a carriage. The difficulties and annoyances of living in the open air are, I believe, entirely in the imagination. The most agreeable holidays I have ever spent have been whilst camping out with a sensible party of ladies as well as gentlemen, and never have we broken up camp to return to houses without regret by all the members of the party. When ladies are in the party, it is better to have a tent, the front of which must always be fully open at night. During the winter months, the southern part of the State about San Diego or Santa Barbara is the most desirable place for patients, as there are seldom more than a dozen rainy days during the year; but in the summer the coast range of mountains north of San Francisco offers by far the most congenial climate, far better than that of the Sierras, owing to the greater equability of the temperature. From the middle of May to the end of October, as a general thing, living in the open air can be enjoyed without any fear of rain. As the summer heat increases, the higher mountains, up to 4,000 or 5,000 feet, ensure an agreeable climate, where the thermometer never rises above 85 deg. (this, in the dry air of the mountains, is about the same, as far as our sensations are concerned, as 70 deg. in England), and never descends below 55 deg., ranging generally from 60 deg. to 75 deg. during the

twenty-four hours. As a general thing, at height above 1,500 feet, the camp can be made in pine-woods, and I believe that there is something antiseptic in the exhalations of these trees; certain it is that they impart a most agreeable odour to the air, particularly in warm weather. As for the cost, the expense is slight, as there are no hotel bills to pay; the journey across the continent is now rendered so easy that an invalid can generally support it without inconvenience, and in fact improve during the trip. In the cold weather the trip can be made by the steamer to Colon, and thence to San Diego by the Pacific Mail Company's ships.—*British Med. Journal, June* 3, 1876, *p.* 687.

29.—ON THE USE OF THE HYPOPHOSPHITES OF LIME AND SODA IN PHTHISIS.

By Dr. M. CHARTERIS, Physician and Lecturer on Clinical Medicine in the Glasgow Royal Infirmary.

[The hypophosphites of lime and soda have great power in checking the night-sweats of phthisis.]

The first case in which I employed the hypophosphites was that of E. M., aged thirty-eight. She was admitted into the Royal Infirmary on March 27th, 1875. She stated that she had had a cough every winter, but this attracted little attention until five months ago, when she had what she termed "inflammation of the lungs." This phrase in Scotland has a wide significance, and may mean anything or nothing. What she complained of now was cough, spitting, and shortness of breath. She had not been "poorly" for five months, and she was so weak and exhausted that she could not move about.

On examining her chest, distinct flattening of both apices was observed. In the infraclavicular region of the left side the "cracked-pot" sound was elicited on percussion. There was also dulness in the same region, but not of the same character or extent, on the right side. In other parts of the chest the resonance was normal. On auscultation there was the usual evidence of a cavity in the left infraclavicular region, and tubular respiration in the corresponding part of the right side. The sputum was abundant, filling twice daily the usual hospital vessel for its reception. It was also distinctly nummular. Temperature 101° in the evening, and 98·5° in the morning. Bowels loose; appetite bad. Generally speaking, there was great emaciation; severe cough and profuse perspiration. She was ordered cod-liver oil, but it produced nausea and vomiting, and had to be abandoned after a trial of ten days. At this date she was very exhausted; the night-sweats were excessive; the temperature 102° in the evening; the appetite *nil*. I now ordered her the hypophosphite of lime in two-grain doses thrice

daily, with little hope of any benefit. Two days after taking it she stated that the sweating had entirely disappeared, and she felt and looked brighter.

Without entering too minutely into the case, it may be mentioned that the amendment was steady. The temperature declined, although occasionally there was an increase for three or four days, and sometimes a smart attack of diarrhœa. She remained four months in the hospital, and subsequently went to the Convalescent Home. On her coming from there she wrote to the nurse and stated "that she spat none, had no night-sweats, and was able to follow her usual occupation as a sempstress." A very important fact was also noted—the return and regular continuance of the catamenia after six weeks' use of the treatment detailed.

The next case was that of A. B., an umbrella-maker, aged fifty. The family history was unimportant, but her present story showed that she had cough, expectoration, and general weakness for three months. Her illness had prevented her working, had reduced her to poverty, and she was thus unable to obtain proper nourishment.

On examination the thorax was emaciated, with dulness on percussion over the right supraspinous and infraclavicular space. The breathing was somewhat tubular over the whole of the same lung, but at the apex it was distinctly cavernous. The expectoration was nummular and occasionally frothy. The thermometer indicated a temperature of 100·5° in the evening, and 98° in the morning. In addition to these symptoms, it may be mentioned that there was great weakness, a feeble appetite, and very profuse night-sweats. After allowing her to remain *in statu quo* for five days, she was ordered the hypophosphite of lime in the same doses as in the previous case.

Four days afterwards, on the 22nd of April, she voluntarily stated that she felt much better than she had done for months, and that the night-sweats had disappeared. She was kept on the same treatment six weeks, and the report stated that she was "bright and cheery," and that she had gained a pound in weight since her admission.

On May 21st it was deemed advisable, for the sake of experiment, to stop the hypophosphite and try her with cod-liver oil. On May 24th patient complained of sickness, but no vomiting. She had slight sweating on the previous evening, the first time for fourteen days. On the 26th the sickness was gone, but the night-sweats were profuse, On the 27th it was considered right to order the hypophosphites again in the same doses. The treatment thus embraced hypophosphite of lime and cod-liver oil.

During the next six days the sweating continued, but in a

less degree, On June 2nd the patient was much better; no night-sweating. She was weighed on this day, and found to be 8 st. 2 lb., being 6 lb. to the good.

From this date the improvement continued. She went to the Convalescent Home, and on her return from it three weeks afterwards, on August 9th, she stated "she was now perfectly well; cough, spitting, and night-sweats entirely gone; and she had resumed her occupation as an umbrella-maker."

One of the most successful cases was a private patient, A. D., aged seventeen. The family history showed that the mother and two sisters had died of consumption, and at no stage of their illness could cod-liver oil be taken without producing nausea and vomiting, however small the dose might be. She had been kept in the house nearly six months, was rapidly losing flesh, sweating greatly at night, and in a highly nervous state through the knowledge of the previous deaths in the family and fear that she was rapidly sinking. She had an irritable, hacking cough, without much expectoration, and, in her own words, stated "she always felt languid, lazy, and tired out, as if it would be no hardship to be in bed all day."

On examination, I found dulness on percussion on the right side, immediately below the clavicle and beside the sternum. This dulness measured transversely and perpendicularly in the former an inch, in the latter an inch and a half. There was no crepitation, but there was bronchial breathing and bronchophony. Without entering into any theoretical inquiry as to causation, there was little doubt that here was consolidation of the lung, limited in character and extent, and all the general indications of phthisis. I use her own words again, because they are plainer and pithier and freer from technicalities than any I could employ. "I sweated a good deal. I wore flannel, and sometimes it was quite damp, and my face and neck so wet that I had to dry them. I did not sleep for some hours after going to bed, and I was very feverish." This was her state when I saw her first, at the end of May. Cod-liver oil and the usual remedies had been tried and abandoned. I ordered three grains of the hypophosphite of lime twice daily, and also to make careful thermometric observations, which were continued for two months. For the first two nights the temperature was 101° at night and 100° in the morning. For two weeks afterwards the thermometer was found to stand at 100·5° at night and 99° in the morning. From this time it gradually came down until it was 98·5° at night and 98° in the morning, and it has continued thus until the present time. With regard to the other symptoms, the sweating stopped the first night and did not recur. The cough became less and less, and in six weeks ceased entirely.

In two months from the time of her commencing the hypophosphite treatment she wrote to me from the country, stating that she often walked six miles in the day. In addition to the hypophosphites she inhaled twice daily a weak solution of ipecacuanha wine.—*Lancet, May* 13, 1876, *p.* 704.

DISEASES OF THE ORGANS OF DIGESTION.

30.—IMPURE ICE AS A SOURCE OF INTESTINAL DISORDER.

By the EDITOR of the PRACTITIONER.

Few medical men who have witnessed the activity of costermongers and others in collecting ice during the winter months in the vicinity of London have not felt certain qualms as to the use the material might subsequently be put to. As the laden carts and barrows have passed under their observation the ice has too commonly presented indications of the sources from which it has been chiefly obtained, namely, the shallow ponds which exist on waste grounds and in meadows in the suburbs, and which ordinarily contain highly impure water. It it true that the purchasers of this class of ice declare that it is used only for freezing and cooling articles of food or luxury, by packing them in it, but never by mixing them with it; and that this ice is never mixed with potable fluids, imported lake-ice or manufactured ice being alone used for the latter purpose. This declaration is no doubt substantially correct; but there are certain possibilities, accidental it may be, of impure ice being used in drinks, and thus becoming mischievous to health, which it is well to keep in mind. The Medical Officer of Health for Marylebone, Dr. Whitmore, has lately directed attention to these possibilities; and an instructive illustration of intestinal disorder caused by the use of impure ice is furnished in the last (the 7th) Annual Report of the State Board of Health for Massachusetts. The illustration is given in the following interesting report by Dr. A. H. Nichols, of Boston:—

Report on an outbreak of intestinal disorder, attributable to the contamination of drinking water by means of impure ice.—Rye Beach is an attractive and popular seaside resort upon the coast of New Hampshire, about fifteen miles distant from the north-eastern corner of Massachusetts; during the months of July and August of each year it is thronged with visitors from the large cities.

At the beginning of the season of 1875 there broke out among the guests of one of the large hotels of this place a somewhat extensive, though comparatively mild epidemic. Being the only practising physician in the vicinity, I was requested by the proprietors of the hotel to make a detailed

investigation as to the causes of the disorder. The result of this examination revealed a novel and uncommonly unsuspected source of contamination of drinking water, and they have, therefore, seemed to me worth communicating to the Board of Health. The disorder in question may be comprehended under the general term disturbance of the digestive system, characterised by a sensation of giddiness and nausea, vomiting, diarrhœa, severe abdominal pain, all of which was accompanied by fever, loss of appetite, continued indigestion, and mental depression. The epidemic, although confined within very limited boundaries, baffled for a considerable time all efforts to trace the trouble to any specific cause; while the *origo mali*, when ultimately detected, proved to be contained in an article of ordinary consumption, usually considered as above suspicion as regards innocuousness. The first few cases coming under observation did not attract particular attention, inasmuch as the symptoms manifested did not differ essentially from those noticed among the visitors in previous years, and induced by drinking the well water of the place, which, especially when the wells are low, is strongly impregnated with sulphate of lime, carbonate of lime, and magnesia. It very soon became apparent, however, that the trouble was limited to the inmates of a single hotel, accommodating about 300 guests, whereas the occupants of another public house, containing rooms for about 200, and distant but one-eighth of a mile, were enjoying an absolute immunity from all illness; nor was any similar trouble known among the neighbouring cottages, containing at least 500 visitors.

This peculiar grouping of the patients rendered it, therefore, tolerably certain that the whole disorder must be referred to some specific, local origin, to be sought for in the immediate vicinity of the hotel; and popular opinion pointed very strongly, from the outset, to the drinking water. This was drawn from several wells, all sunk in an elevated ridge, and safely removed from drains, cesspools, dung-heaps, or other source of pollution. It was also ascertained, upon inquiry, that, in some instances, those persons affected, having apprehended trouble from the use of the water, had carefully limited themselves since their arrival to other beverages, but, as afterwards transpired, had not hesitated to use ice, either melted or otherwise.

With respect to the drainage of the house, it appeared that during the previous winter the services of competent engineers from Boston had been secured, under whose supervision an elaborate and complete system of sewerage had been recently constructed, by means of which all the discharge from the various sinks and water-closets was conveyed directly into the ocean. The point of discharge of this sewer was at a safe

distance from the house, while the sewer itself was securely trapped and ventilated in such a manner as to preclude the idea of the escape of any foul gas within the house.

Attention was next directed towards the cooking utensils, but all the articles pertaining to the kitchen were found to be scrupulously clean, nor did it appear that any agent or utensil was employed in the preparation of the food which would in any way tend to produce the symptoms complained of. Furthermore, the milk-supply was investigated, and found to be of unquestionable purity.

The process of elimination was in this manner continued, until at length suspicion became directed to the supply of ice furnished to the house. It may be mentioned at this point, that a large portion of the ice consumed in this town is gathered from shallow ponds, formed during the winter by the flooding of the meadows, and, therefore, contains as a rule, more or less grass and other vegetable matter, and is consequently far less transparent than the article commonly supplied in our large cities. I was not particularly surprised, then, to find that the ice in this case was rather impure and opaque, and that it contained numerous foreign substances varying in size, and apparently of vegetable origin.

The theory that the outbreak, now increasing in extent and severity, was dependent upon the ice supply, was suddenly strengthened by some pretty direct evidence, of which the following examples may be given:—

1. A resident of the place, upon being questioned on the subject, volunteered the testimony that during the previous winter he had taken home some ice from the same pond where the ice-supply of the hotel was obtained, and having consumed a portion with the view of testing it, had experienced nausea and distress for the remainder of the day, which led him to decide that it was unfit for use.

2. Several persons affirmed that they detected a decidedly disagreeable odour emanating from the ice as it melted.

3. Two gentlemen having taken a quantity of ice with them upon an excursion, and drunk the water from it, were made violently ill.

4. The atmosphere of the house in which the suspected ice was stored was found to be decidedly offensive.

5. When some of the melted ice-water was poured into a glass, and held in front of a dark-coloured object, a strong light striking the glass from one side, it was found to be decidedly discoloured, and charged with suspended matter.

A visit was now made to the pond, and the condition of things here found removed all doubt as to the exceptional foulness of the water from which the ice was formed.

This pond is a flooded marsh, of irregular outlines, about two-thirds of a mile in length, and varying in width from 200 to 800 feet, with a uniform depth of about two feet. The source of the water-supply was a small brook entering the lower end of the pond (bringing down all the sawdust from two neighbouring sawmills), and several springs said to be situated at the upper end. There had formerly existed an artificial channel, by means of which was maintained a direct communication between the pond and the ocean; but for the past two years this channel had been filled up with sand and stones thrown up during heavy storms by the action of the sea, which drives in here with extreme violence. Of late, therefore, the water of the pond has become practically stagnant, although a small quantity constantly percolates a bank of gravel separating the pond from the ocean.

A glance at the lower end of the pond was sufficient to demonstrate the source of the foulness of the water, for at this point, a space of about 500 feet long and 150 feet wide, directly in front of the mouth of the brook, was occupied by a homogeneous mass of putrescent matter, composed of *marsh mud* and *decomposing sawdust*. The water in the vicinity of this bank was discoloured black, and when stirred up emitted an intolerably offensive odour. Several large houses are situated at no great distance from this end of the pond, the occupants of which, upon being questioned, asserted that when the water was stirred up by the rowing of boats, or ruffled by a wind blowing in the direction of the houses, the air was not unfrequently polluted to such an extent as to render it necessary to close the windows. Of course there could be no question but that this foul matter held in suspension in the water was conveyed by currents and winds to every part of the pond, and in sufficient quantity to render the water in every part absolutely unfit for drinking purposes.

In order to obtain further evidence as to the admixture of this foul matter with the ice, a quantity of the ice, having been cleansed from all surface impurities, was placed in a tub to melt, and the water thus obtained was poured into a fresh demijohn, sealed and forwarded for analysis to Prof. W. R. Nichols, who reported as follows:—

"The water contains in suspension a considerable quantity of vegetable matter more or less decayed, and possesses a slightly disagreeable odour, which becomes more evident if the water is warmed.

"Of the organic matter which is suspended in the water, and which may be removed by filtration, a portion, consisting of the larger and heavier particles, settles somewhat readily. Another portion, being more finely divided, remains for an

indefinite time diffused through the water, and would be drunk by any one using the ice in the ordinary way.

"I do not think it unreasonable to suppose that the presence of this decaying organic matter may have been instrumental in bringing about the unpleasant results you have observed."

A sample of water was likewise taken for examination from the pond in question. This sample was obtained from the central portion of the pond, in the early morning, when no air was stirring, and the water being quite calm and undisturbed by undercurrents, the greater portion of any matter held in suspension would at that time be precipitated to the bottom of the pond. Consequently, the sample taken would represent the purest water obtainable from the pond under any circumstances.—*Practitioner, September*, 1876, *p.* 234.

31.—ON THE TREATMENT OF DIPHTHERIA.

By Sir JOHN ROSE CORMACK, Physician to the Hertford British Hospital of Paris.

The treatment of diphtheria requires to be considerably varied in its details, according to the nature of each case, the constitutional peculiarities of the patient, and the type of the epidemic. There are, however, certain general principles of treatment which must always be acted upon, and the infringement of which may lead to disastrous consequences.

Even a limited experience will teach an observant practitioner not to expect curative results in diphtheria from particular medicines or vaunted formularies of treatment, but to strive to support life by the measures best suited to each case, rationally using medicines as exigencies and opportunities arise, and not in a routine fashion. The first Begbie of Edinburgh, and, I may say, the best physicians who have given their views on this subject to the profession, express themselves to that effect. Begbie, whose skill as a therapeutist stood very high, concludes the summary of his able and instructive essay on "Diphtheria and its Sequels" in the following sentence:—"Lastly, as we have no specific remedy for diphtheria, the disease and its sequels must be treated on the general principles which regulate our practice in fever, in inflammation, and in nervous disorders of asthenic character."

The treatment of diphtheria may be conveniently discussed under the three heads of *general*, *local*, and that which pertains to the *paralytic affections of convalescence*.

The *general treatment* has to be considered in respect to *atmosphere*, *food*, and *medicines*.

The temperature of the room ought to vary as little as possible, a temperature of about 17° Cent. (63° F.) being maintained.

The patient ought to be screened from currents of air, care being taken that free ventilation is not interfered with, and that the air is moistened by a regulated escape of steam from a suitably-contrived kettle. The arrangement adopted in the case of E. G. answered very well. Nothing can be better for the purpose required than Dr. Pretty's kettle, which is thus described by Sir William Jenner:—"This is a tin kettle with a small aperture at the top, closed by a screw instead of a common lid. From the front of the kettle project two spouts of about three feet in length. One spout springs from the upper part of the kettle, and passes forward in a straight line; the other spout springs from near the bottom of the kettle, and passes obliquely upwards. The lower spout ends in a spoon-like projection, just under the slightly curved-down open mouth of the upper spout. The steam passes out of the upper spout, and the condensed vapour drops into the little spoon, and is returned by the lower spout to the bottom of the kettle." A thermometer and a steaming-kettle are indispensable in the chamber of the diphtheritic patient. The maintenance of good ventilation, combined with a moist, warm, and equal temperature, is a paramount necessity when tracheotomy has been performed; and in all cases, and in all stages of the disease, in which there exists diphtheritic sore-throat, it is important, as a means of moderating the paroxysms of glotto-laryngeal spasm, that the patient inhale air which is soft, warm, and equable in temperature. Even in the rare cases in which the throat affection is absent, it s the duty of the physician to take the measures best calculated to secure in the sick-room such an atmosphere as has been described; for in such cases the disease may at any moment manifest itself in the air-passages.

The support of life by stimulants and aliments—the feeding of the patient—is universally stated to be an essential element in the treatment of a case of diphtheria. Neither alimentation nor tracheotomy were *curative* agents in the case of E. G.; nor in any case of diphtheria can they be so regarded. Nevertheless, they were the principal means by which E. G. was saved from death; and by them, indeed, is recovery chiefly rendered possible in all such cases. Success in alimentation, and success in tracheotomy, are only means by which we gain time, by which we support life for a period, we hope, of sufficient duration to enable the disease to run its natural course, guided and aided by us whenever therapeutic opportunities arise.

It is necessary to insist emphatically on the fact, that, in the treatment of diphtheria, there is nothing approaching alimentation in importance. Unfortunately, however, this knowledge is too often of little importance to physicians and patients in bad cases, for in such there is almost no power of assimilation,

and there is likewise extreme difficulty in inducing the patient to take food, or having taken it, for him to retain it. Diphtheria-stricken patients generally loathe food, and children often struggle violently against attempts to feed them. When food is swallowed it is often rejected immediately. The difficulties in the way of feeding are always great, and sometimes they are insuperable; but, still, they must be resolutely faced. The alimentation of diphtheritic patients requires great skill, tact, and, I might almost say, inventive power on the part of the medical attendant, assisted by the co-operation of a well-disciplined, conscientious, and obedient nurse. Each case has dietetic difficulties which are its own, and must be met from hour to hour as they arise.

While, therefore, it would be tedious to go into details, a short statement of the practical principles which require to be carried out may be briefly stated. Pounded raw beef in very small quantities, moistened with the juice of under-done roast-beef, is generally the best basis of alimentation. It will seldom be expedient to administer more of this preparation than one teaspoonful at a time, and not nearly so much if there be nausea. With the raw beef and other aliments, a little *pepsina porci* ought to be given from time to time. I have seen the difficulties of alimentation much diminished by the judicious addition of pepsine to the food. Together with the raw beef and other aliments, we must give stimulants liberally: the exact quantity must be determined by the exigencies of each case, and will be subject to frequent variations. As a general rule, however, it is well to remember that brandy is well borne in diphtheria by patients of all ages. Its effects require to be carefully observed in young subjects; but it may be accepted as a fact, that children bear brandy, sherry, and all spirituous stimulants exceedingly well. Proofs of the accuracy of this statement constantly present themselves in practice, both in respect to diphtheria and other diseases.

"When," says Sir William Jenner, "the disease begins with marked feebleness of pulse, dusky redness of throat, and extreme sense of general weakness, wine in full quantities is required at an early period. From six to eight ounces of sherry or port for an adult, and as good a diet as the patient can take, must be given from the first. In the course of the disease much larger quantities of wine, or a proportionate quantity of brandy, may have to be given. Of course, the quantity of stimulant must be regulated by the age and habits of the patient, as well as by the character and the stage of the disease; but remember that, as a rule, young children bear and take with advantage, in diseases of depression, much larger quanties of stimulants than you would probably suppose. A child of three years of

age, now under treatment for diphtheria at the Children's Hospital, in taking, with apparent advantage, from one to two drachms of brandy every hour, *i.e.*, from three to five ounces of brandy in twenty-four hours."

When we have nausea und vomiting to contend with, we must chiefly trust to brandy and pounded raw beef (duly pepsinated) as the dietetic articles most fitted for keeping up life. When the stomach will bear more bulky food, it is always useful to give a variety of suitable aliments, among which may be mentioned milk, egg-flip, and panada. As soon as it can be borne, cod-liver oil ought to be given. It has a wonderful power in preventing and restoring the waste of tissues.

There is very little if any scope for the administration of medicines when a bad case of diphtheria is at its worst. Till the fury of the disease has spent itself, it is wise to give as little medicine as possible, and never to give any at all unless the indication be clear and positive. When there is nausea and vomiting we may harmlessly and hopefully give oxalate of cerium or creasote, but we must avoid, on account of its depressing influence on the heart, the other great remedy for irritability of the stomach—hydrocyanic acid. As soon as the patient can digest it, iron in some form ought to be given in very small doses. It may be very usefully combined with a syrup of the phosphate of lime. Ferruginous medicines are urgently demanded from the very dawn of convalescence by the anæmic aspect of the patients, while cod-liver oil and phosphate of lime are equally called for by their emaciated appearance. Building-up treatment, alimentary and medicinal, is most useful in preventing or moderating the paralytic affections incident to advanced convalescence.

There is no specific medicine for diphtheria—there is no way of *curing* that disease; but there are many medicines and many measures of signal benefit to diphtheria-stricken patients, by the skilful use of which they are often enabled to recover.

With the use of general means, it is sometimes proper in laryngo-tracheal manifestations of diphtheria to combine local treatment to dislodge or dissolve the false membrane. The treatment by emetics adopted for the former purpose is local in its intention, but general in its action on the patient.

Emetics in diphtheria are seldom of much use; but still there are many cases in which it is right to try to effect dislodgement of the false membrane. With that object, an emetic was administered to Miss P., on Sunday, 2nd January (p. 805); and for the same purpose emetics were given to E. G.

The emetics which ought to be selected are those which do not depress, and which act quickly. Perhaps sulphate of zinc is the most, and tartar emetic the least, suitable. The latter is

not only unsuitable, but it is pretty certain to prove dangerous by its depressing action. Speaking of tartar emetic as an emetic in diphtheria, Trousseau says:—"The selection of the particular emetic to be employed is not a matter of indifference. Tartar emetic, so lauded by some, seems to me to be the most dangerous of all emetics." . . . "It causes extreme prostration and accelerates death." Trousseau's teaching, unfortunately, is not universally followed in this matter, as I have had several occasions to observe. The following instance is confirmatory of Trousseau's statement. All the circumstances being remarkable are accurately remembered by me.

On a summer morning in 1875, I accompanied my friend Dr. Borthwick, of Dumfries, on a visit to one of the great hospitals of Paris. During a long drive to the hospital, the chief subject of our conversation was the pathology and treatment of diphtheria in relation to emetics and tracheotomy in the laryngo-tracheal manifestation of the disease. We knew nothing of the cases we were to see. On our arrival we entered a medical ward where a physician was examining the first case of diphtheria, we were told, which had been received into the hospital during the current year. The sick man, aged about forty, was sitting half-dressed on his bed, a circumstance explained by his having just returned from the privy situated outside the ward. We ascertained that he had been about forty hours in the hospital, but did not learn the previous duration of his illness. Since admission, he had had low diet and no stimulants. He spoke in a husky whisper. He had had no stridulous breathing From his replies to questions, we ascertained that he chiefly complained of dyspnœa, diarrhœa, loathing of food, and debility. The visible part of the interior of the throat was covered with false membrane; and the physician announced, after applying the stethoscope, that he heard semi-detached false membrane flapping in the trachea. The treatment prescribed consisted in a continuance of the antiphlogistic regimen, and the exhibition at short intervals of tartar emetic in doses of ten centigrammes. I do not know whether it was the prescriber's object to obtain the dynamic action of the drug, or whether its emetic effects were looked to as a means of dislodging the false membrane from the air-passages. Before we left the ward, the patient went to and from the privy with tottering steps. The exertion induced extreme vital depression, unaccompanied by stridulous breathing or increase of dyspnœa. Dr. Borthwick and I agreed that the only chance—and that a very small chance—of recovery which this man possessed consisted in his being kept in the horizontal position, and liberally dosed with brandy, an emetic of sulphate of zinc being delayed till a rally should occur, and tracheotomy being resorted

only if it should be demanded by threatening asphyxia. We were equally agreed that under the combined depressing influences of diphtheria and antimony, it was not likely that the patient could survive more than a few hours. Our evil prognosis was correct, for the patient died in a state of collapse six hours after our visit.

The tartar-emetic treatment of diphtheria has been generally regarded as one of the wildest heresies in the practice of medicine, though some able men of large experience think and teach otherwise.

In 1859, during the prevalence of a severe epidemic of diphtheria at Paris, three cases were reported as having been treated successfully by Bouchut at the Sainte-Eugénie Hospital by large doses of tartar emetic. The three patients took the medicine according to the following formula:—Tartar emetic, 75 centigrammes; syrup of poppies, 15 grammes; and gum-water, 100 grammes; mix; half a teaspoonful to be taken every hour. The quantity intended to be taken in a day was from 50 centigrammes to a gramme—that is, from 7¼ grains troy to 14½ grains troy of the tartar emetic. There were two objects in view—the excitation of vomiting as a means of getting rid of the false membrane, and the mastery of the disease by the successive dynamic shocks. It is stated that the nurse, observing one of the three patients in a suffocative paroxysm from the presence of laryngeal false membrane, gave a double dose of the mixture with the addition of some tepid water. Forthwith, the child in a violent vomitive effort ejected a tubular membrane, two inches in length. The incident is interesting, but it does not tend to justify the administration of tartar emetic in laryngo-tracheal diphtheria. Would it not have been equally efficacious, and much safer, to have administered an emetic dose of sulphate of zinc, followed by some brandy to sustain the feeble heart during the vomitive crisis?

Tracheotomy, through the opposition of the family, was too long delayed in the case of E. G. A similar difficulty often occurs in private practice. Each case has to be decided for its own merits; and the physician in charge must be in constant readiness with his instruments and appliances to perform tracheotomy at very short notice. In the majority of cases the actual crisis is so sudden as to leave no time to divide responsibility with a colleague. The patient must not therefore (if the attendant can help it) be put in jeopardy by waiting for a formal consultation, or till a surgeon can be found to admit oxygen to the craving lungs. On the other hand, if time permit, there is no emergency in medical practice in which it is more for the advantage of patient and practitioner that there should be a collation of opinions and a division of responsibility.

In the diphtheritic semi-asphyxiated child, tracheotomy is an operation requiring great care and a good light. There is no surgical difficulty, but the operator, if unaccustomed to use the knife, must be cautious, Nay, even an expert requires to proceed slowly, for children with turgid necks have been lost from hurried tracheotomy, performed with imperfect light, by good operators. The difficulty and danger of tracheotomy in diphtheritic children arise from the turgidity of the veins of the neck, caused by the state of semi-asphyxia. The sudden gush of venous blood which occurred in the case of E. G. illustrates this remark and confirms its correctness.

The patient ought to be placed on his back on a table, with a narrow solid cushion so adjusted under the neck as to project and stretch the trachea. A quart bottle wrapped up in wadding, or in anything at hand, answers admirably. This being arranged, the operator, with the least possible delay—for the patient's position is a very trying one—makes an incision through the skin, in the mesial line, from the cricoid cartilage nearly to the sternum. The tissues ought then to be divided layer by layer, the gorged veins being carefully avoided, and the muscles and vessels being held to each side by the fingers of the left hand of the operator, or by two blunt hooks held by an assistant. When the trachea has been laid bare, a small incision is made in it, close to the cricoid cartilage, with a sharp-pointed bistoury, after which a probe-pointed bistoury is employed to complete the necessary opening. By means of the tracheotomy-dilator, or if that be not at hand, by means of a common dressing forceps, the opening is dilated, and the operation completed by introducing a double canula, and then fastening it behind by tapes. As in the case of E. G., it may be necessary to draw out detached portions of false membrane before the canula can be introduced. In such cases, it is well to keep the opening dilated till the false membrane and mucosity have been got rid of by coughing or otherwise. The inner canula in some cases requires to be frequently removed and cleansed from obstruction. For such emergencies and for such occurrences as the grave accident which befell E. G., on the third night after the operation, a reliable attendant must be ready to intervene at a moment's notice.

Another method of performing tracheotomy in diphtheria has recently been made by Saint Germain, of the Hôpital des Enfants Malades of Paris. The object in view is to avoid hemorrhage from cutting the engorged veins. A red-hot probe-pointed bistoury is the instrument employed. It is used in the first instance to burn through the skin, intervening tissues, and crico-thyroid membrane; and then by using the cutting edge, to divide the cricoid cartilage, and a few rings of the trachea.

With the aid of Lalonde's dilator, the canula is then introduced.

Tracheotomy, like venesection, and the use of the stomach-pump, is a mechanical service, which every one who assumes the responsibilities of medical practice ought to be able to render to his patient at once, whenever the emergency arises. The question is not whether tracheotomy belongs to medicine or to surgery—that is of secondary importance—but whether every man ought not to save life when he can do so, by the use of his hand. It is expedient that some should specially cultivate medicine, and others specially cultivate surgery; but it is a great scandal when a physician in certain energencies refuses to use the surgical knife, and when a surgeon in certain emergencies refuses to write a medical prescription.

Local applications intended to destroy, detach, or dissolve the false membrane in laryngo-tracheal diphtheria are in favour with many. Fortunately they are not so much relied on now as they were by Trousseau and those who wrote by his inspiration. This change of opinion is, as yet, more apparent in the conversation and current practice of French physicians than in their published works. It is now generally admitted that Trousseau attached an undue, and even a dangerous, importance to destroying by caustics the false membrane as soon as it appeared on the pharynx, and on any part of the visible mucous membrane of the throat. His statement that the destruction of the false membrane not only prevented the spread of the local mischief, but even arrested the career of the general disease itself, is now denied by most French clinicians of repute. This change of opinion is fortunately likely to be permanent, for it has been clearly shown, and is now generally believed, that caustics, strong acidulated washes, and active chemical solvents, act mischievously by irritating the mucous membrane, and so exciting increased exudation of cacoplastic lymph.

Gargles, washes, and various other applications, if not of an irritating character, may be used with impunity, and sometimes with benefit. Some of them tend to promote separation of the false membrane without producing any rawness or hurtful irritation of the subjacent mucous membrane. The advantage derived from them is, we must remember, frequently temporary, and more apparent than real. So long as the disease is in the exudation stage, layer after layer of false membrane will continue to be deposited on the surface of the mucous membrane; and the rapidity with which this reproduction proceeds may more than counterbalance the benefit derived from the separation of the upper strata. It follows, therefore, that the only topical applications to be used are those which do not irritate.

Among the safe and more useful topical applications are glycerine and borax (of the *Br. Ph.*), lime-water, a very diluted solution of hydrochloric acid in distilled water, and a solution of one drachm of neutral sulphate of soda in eight ounces of water.

Moist warmth applied externally to the throat generally gives much comfort, and is in no way injurious. It greatly mitigates the pain arising from tumefaction of the cervical glands.—*Edinburgh Medical Journal, June* 1876, *p.* 1079.

32.—ON HYPODERMIC ALIMENTATION.

By Dr. G. F. Duffey.

In a case of chronic gastric ulcer, accompanied by high temperature, almost imperceptible pulse, and the delirium of inanition, and in which even milk was constantly vomited and rectal injections were no longer retained, a trial was given to hypodermic injections of a teaspoonful of milk, alternating with beef extract, every two hours. These injections were continued for four days, and at the end of this time there was a marked abatement of the unfavourable symptoms. A little milk was given by the mouth, but, as it again caused pain, cod-liver oil was given hypodermically, every two hours, for three days, after which the patient had sufficiently recovered to take food in the usual way. The patient then received sixty-eight hypodermic injections in different parts of the body, receiving in one day as much as four ounces of cod-liver oil. Two small abscesses formed, both from the milk. The oil caused no pain, but the precaution was taken to raise it almost to the temperature of the body. In another case olive oil was used, and the patient, a lunatic, was supported by hypodermic injections for twenty days without any other aliment whatever; he made a good recovery (Richmond and Louisville Med. Jour.). Hypodermic injections of liquified fats, saccharine solutions, and yolk of egg, have also been used. Stricker and Oser have even tried injections of peptone. Krueg has found this method eminently successful in the treatment of an insane patient who refused to eat, and in whose case the œsophageal sound was fraught with danger. Nutrient hypodermic injections were decided upon. The syringe, which could contain 15 centigrammes of fluid, was connected, by means of India-rubber tubing, to an ordinary Pravaz's syringe. The passage of the fluid could be readily seen in the glass-receiver of the syringe; the India-rubber tube diminished the shock and rendered any movement on the part of the lunatic less dangerous. At first one syringeful, afterwards two (30 centigrammes) were injected each day. The duration of the operation varied from half an hour to an hour.

The longer the time devoted to it, the less was the pain caused. Once only was it followed by an abscess, the contents of an egg having been injected. These hypodermic injections were had recourse to from the 7th to the 25th February, with the exception of the 13th, 16th, 18th, and 23rd, during which days he consented to eat, and also were used from the 27th to the 30th of March. The unpleasant odour caused by prolonged fasting disappeared after the first injection (Rev. des Sci. Med., 15 Jan.). The subcutaneous injection of sheep's blood in the insane was the subject of a paper recently read before the Société de Médecine Pratique, by Dr. Voisin (London Med. Record, April 15). This method of treatment is not directed against the mental state, but is intended to keep up nutrition in sufferers from melancholia considered as incurable. In one case fifty grammes of blood (1¾ oz.) were injected into the subcutaneous cellular tissue of the arm every eighth day.

The Transfusion of Milk.—In connexion with the above-mentioned subject of hypodermic alimentation, may be noted a case in which a patient, who was apparently moribund four days after the operation of double ovariotomy, was revived by the transfusion of eight and a half ounces of fresh cow's milk into the median basilic vein. The woman made a good recovery (American Journ. of the Med. Sciences, January, 1876). The operator, Professor T. Gaillard Thomas, says he is averse to the transfusion of blood, and was induced to employ milk, from the success which had attended its use in the hands of Dr. Hodder, when injected into the veins of apparently moribund cholera patients in the Canadian epidemic of 1850. Dr. T. W. Howe, of New York, has also injected six ounces of warm goat's milk into the cephalic vein of a patient suffering from tubercular disease, and who appeared to be dying from starvation, in consequence of inability to retain nutritious material by either stomach or rectum. This patient felt better after the operation, but only survived it four days. There were no clots in the veins of the arm or in the lung. Donné has shown that milk may be injected into the veins of dogs and rabbits without injury to them.—*Dublin Journal of Medical Science, June* 1876, *p.* 584.

33.—INTESTINAL OBSTRUCTION, WITH STERCORACEOUS VOMITING, TREATED BY LARGE DOSES OF OPIUM, FREQUENTLY REPEATED.

By Dr. Herbert Junius Hardwicke, Sheffield.

R. T., a married, healthy looking, and stoutly built man, about forty years of age, called at my surgery on the morning of October 18th, and complained of a severe pain in the abdomen, which commenced early in the morning of that day.

For four days previously, he had been taking purgative medicines from a druggist, but could not get his bowels to respond to them. He requested me to give him some medicine to open his bowels, or he should die from the pain. I sent him home, with strict orders to go to bed and foment his bowels with hot water flannels, and to have an injection of one pint of warm gruel at once; and gave him six pills, of one grain of calomel and half a grain of opium in each, to take one every second hour until he was relieved from pain. I was at the time due at a labour-case, and promised to see him as soon afterwards as I could. The same evening, I called to see him, and found that he had not had a motion, and that the pain was worse. His face was pale; his countenance anxious; pulse 80; tongue coated; he had sickness, but no vomiting. The abdomen was distended with tympanites, and there was pain referred to the right iliac region more particularly. I ordered a continuance of the fomentations and a repetition of the enema, which latter was returned with no fæcal admixture whatever. One grain of opium pill was now given to him every two hours. I saw him again early the next day (October 19th), and found him much worse; tongue dry and brown; pulse nearly imperceptible. The pain was greatly increased, and more generally over the abdomen; he had sickness and vomiting. I gave him brandy and water, and ordered him to continue taking the pills every second hour. I saw him again in the evening with a neighbour practitioner, who recommended an increase in the quantity of opium. I accordingly gave him one grain every hour, and brandy and water regularly. The vomited matter was now decidedly of a stercoraceous character, and the pain excessive; and the patient seemed inclined to sink. On calling to see him next morning (October 20th), I found he had been vomiting fæcal matter incessantly during the night, and had been exceedingly full of pain. Whilst I was there, however, after a severe attack, the vomiting nearly entirely ceased; and just then the patient informed me that he thought the fomentations had moved the obstruction, as he felt greatly relieved. I at once, acting upon his own suggestion, ordered an enema to be administered, which, to my great satisfaction and the patient's intense relief, was returned in company with three or four hard pieces of fæces, like black marbles. Shortly afterwards, he passed a large, dark-coloured, offensive stool, and from that time continued to improve. The pain gradually subsided, and the patient, in two or three days, was able to sit up and take food.

This case, to my mind, clearly proves the efficacy of opium in large doses, and frequently administered, in cases of intestinal obstruction. The obstruction here was clearly caused by the abuse of purgative medicines, which were administered by an

incompetent person, who represented to the patient that he was qualified to practise; and opium was the cure. It appears to me that the value of opium in these cases is not sufficiently appreciated, at least in this country. I believe that in Germany the treatment I adopted in this case is pretty generally followed. I once heard a celebrated professor in one of the German universities say that more harm than good was often done in cases of intestinal obstruction by too much interference on the part of the medical attendant, especially in England. Of course, there are many cases of intestinal obstruction which demand prompt interference, in order to save the life of the sufferer; but many of such cases require operations, such as gastrotomy, from the mere fact that the previous treatment has been injurious, or, in other words, because the medical attendant has "done too much," instead of allowing Nature, assisted by opium, to overcome the difficulty. Too much interference in these cases is worse than if the patient had been left entirely to the care of Nature. I think it must be admitted that opium, given in full doses and often repeated, is the remedy—and the only remedy—in cases of intestinal obstruction. It might perhaps be urged that the large amount of opium given in such a short time would be injurious. I can only say that this man took, from six o'clock in the evening of the 18th to the same time on the 19th, thirteen grains; and from then until eleven o'clock in the morning of the 20th, seventeen grains; in all, thirty grains in forty-one hours, without the slightest sign of narcotism whatever.—*British Medical Journal, July* 1, 1876, *p.* 7.

DISEASES OF THE URINARY ORGANS.

34.—ON THE RECOGNITION OF SUGAR IN HEALTHY URINE.

By Dr. F. W. Pavy, F.R.S., Physician to Guy's Hospital.

Does sugar exist in healthy urine? To this question it is important, both from a physiological and a pathological point of view, that we should be able to give a settled answer. The views, however, that are to be seen expressed show that a by no means settled state of opinion exists; and instigated by a desire that at least in my own mind there should be no indecision I have undertaken an examination of the evidence procurable upon the subject, and will here communicate the results obtained.

[Dr. Pavy then explains his elaborate and careful mode of testing this subject, and ends his paper as follows:—]

The recognition of sugar as a constituent of healthy urine

shows that there is no abrupt boundary line existing between health and disease. As is the condition of the blood in relation to sugar, so is that of the urine; in other words, the urine partakes of or represents the character of the blood as respects this principle. Observation shows that it is the natural state of the blood to contain a minute quantity of sugar. No matter from what part of the circulatory system the blood is collected, on being treated so as to get rid of its albuminous and colouring elements it yields a slight reaction with the copper solution. From such a state, the urine derives a slight saccharine impregnation, the sugar doubtless passing off by virtue of its physical tendency to diffuse. With an increased quantity of sugar in the circulatory system an increased amount is immediately visible in the urine. It does not signify whether it arises from an internal or an external source; that is, whether from some modified functional operation, or from an artificial injection into the circulation—let sugar exist to an increased extent in the blood, and the same will also be noticeable in the case of the urine.

Bernard speaks of the capacity of the circulation for tolerating the introduction of a certain amount of sugar without its appearing in the urine. He goes so far as to give a sharp line to this tolerating capacity. He says the extreme limit of sugar which the blood can tolerate and retain is comprised between 2·24 and 2·60 grammes per 1000. It is about 2·50 grammes for a dog. The proportion of sugar contained in the blood may undergo oscillations, but if it do not surpass 2·50 grammes per 1000, it will not be shown by the urine. If, on the contrary, it should pass this limit, glycosuria manifests itself. Nothing is said about the examination of the urine otherwise than by the rough and ordinary method, and it may be assumed that such was the process upon which the proposition enunciated is founded. Now, seeing that a negative reaction under the ordinary mode of testing is not to be taken as evidence that the urine is absolutely free from sugar, but simply that it does not exist in sufficient quantity for the test to reveal it, the statement should stand that when the proportion of sugar in the blood attains a certain point, it passes off with the urine in sufficient quantity to be recognisable by ordinary testing, whilst when below the given point the amount escaping is too small for the test to furnish a reaction. It is not an absolute question of presence or absence of sugar that has to be dealt with, but amount of sugar on the one hand within and on the other beyond the capacity of ordinary testing to reveal it. The hard line which has been drawn fails to have more than an apparent existence.

I regard the fact that sugar is susceptible of recognition in

healthy urine as of the highest importance with reference to the glycogenic theory. It tells strongly against the validity of this doctrine. I strenuously contend that there is no active destruction of sugar carried on in any part of the circulatory system. If sugar reach the general circulation, whether from the liver or by artificial introduction from without, it is to be discovered in the blood in all parts of the system. Under natural circumstances, the blood contains only a minute proportion of sugar, and still from this minute proportion the urine acquires a recognisable saccharine impregnation. Such being the case, what, it may be asked, might be reasonably looked for if sugar were constantly being discharged from the liver as is maintained under the glycogenic theory? Passing off as it does with the urine in correspondence with its entrance into the general circulation, the exercise of a glycogenic function by the liver would involve in proportion to its activity, a more or less highly saccharine condition of the urine—the condition, indeed, which actually exists in diabetes.

From a pathological as well as a physiological point of view the recognition of sugar as a constituent of healthy urine has a bearing of considerable importance. It enables us to reconcile ourselves to the instances in which sugar is incidentally met with to a moderate extent in the urine without being associated with any clinical significance. Every degree of variety is presented in the condition of the urine in relation to sugar, from the state belonging to health to that of confirmed diabetes. The two states are not separated from each other by a sharply defined line of demarcation. Sugar is encountered in the urine as one of the phenomena of idiopathic diabetes, but because sugar may happen to be encountered in the urine it does not follow that diabetes exists. Without the absolute production of what may be called a decided and neat reaction it is not at all uncommon in testing urine to find that a certain amount of reducing effect is produced upon the copper solution beyond what can be accounted for by the action of uric acid. In other, but rarer instances sugar may be present to an unmistakable extent without having anything to do with diabetes. About a year back I was consulted by a lady, twenty-two years of age, for symptoms of renal colic. She brought a specimen of urine with her, and after examining it for albumen, from force of habit and without any special reason to lead me to do so, I tested it for sugar. To my surprise, for there was nothing in the history or condition of the patient in the slightest degree suggestive of diabetes, it gave a neat reaction of sugar, and on subsequently making a quantitative analysis I found that it contained 3·42 grains to the fluid ounce. When the patient visited me again ten days and six weeks afterwards, and brought, at my request,

several samples of water, they all showed a negative behaviour with the copper test. No dietetic or other treatment for diabetes had been employed. A gentleman, about sixty years of age, came to me suffering from a lichenoid eruption. In order to complete my investigation of his case, I desired that some urine should be passed in my consulting-room. On analysis I found that it contained 2·55 grains of sugar to the fluid ounce. I examined the urine of the patient again upon two occasions afterwards, and each time without finding any sugar. No diabetic treatment had been adopted. Quite recently I was called upon to advise in a complicated case, attended with great debility, and nothing suggestive of diabetes. The urine contained 4·44 grains of sugar to the fluid ounce; and a few days later, without any diabetic restriction in diet, 2·18 grains to the fluid ounce. Between this kind of condition, where the presence of sugar has no clinical significance, and that belonging to confirmed diabetes, every intermediate degree of glycosuric state may be encountered. With such facts before us, it is evident that a broad view requires to be taken with respect to treatment. Each case must be allowed to stand upon its own merits, and be treated according to the precise condition existing.—*Guy's Hospital Reports*, 1876, *p.* 413.

35.—THE TREATMENT OF ACUTE ALBUMINURIA.

By Dr. F. DE HAVILLAND HALL.

The treatment of cases of acute albuminuria being still a subject on which there is great difference of opinion, I am induced to relate the experience I gained as Resident Medical Officer at a large dispensary during an epidemic of scarlet fever (about three hundred cases), in which dropsy was a frequent sequel.

Directly any albumen was detected in the urine, the patient was ordered the perchloride of iron, and was allowed no solid food except a little bread and milk, and as much water as he liked to drink; this treatment, together with keeping the skin gently acting, sufficed in the majority of cases, but in a certain number the urine was almost suppressed, and in some there were uræmic symptoms. Whenever either of these contingencies occurred I forbade all food for twelve hours, the child to have nothing but water and a drink made of acid tartrate of potash (℥j. ad. Oj.) in sweetened water with a little lemon-juice. If at the end of this time the kidneys were beginning to act I allowed a little milk, but not more than a pint in the twenty-four hours; if, however, the uræmia continued with little or no urinary secretion, I persevered with the water and bitartrate of potash, and in severe cases nothing else has been given for thirty-six hours. Dry cupping, mustard poultices over the loins, and a

purgative were the only additional remedies employed. The explanation of the good effects of abstention from solid food, and especially meat, during the course of acute desquamative nephritis, is that if a patient is entirely deprived of nitrogenous food the work of the kidneys is lessened and the urine is rendered less irritating, and the mild diuretic action of the bitartrate of potash seems to be useful.

Dr. Andrew in his paper "On the treatment of Rheumatic Fever by a Non-Nitrogenous Diet," points out a way in which the treatment I advocate may be extended, inasmuch as by the addition to this diet of arrowroot biscuits and thin water arrowroot, the patient will be able to exist for a longer time without injurious depression than he could on water alone; this plan of treatment has also the effect of rendering the urine alkaline and less irritating.

Mr. Churton, in the British Medical Journal (March 4, 1876), has reported some cases of puerperal convulsions which were treated by keeping the patient almost entirely on non-nitrogenous articles of diet.

In September 1875 I had an interesting case under my care in the Westminster Hospital.

The notes are as follow:—

Alfred Trott, aged 9, admitted into Westminster Hospital on September 14th, 1875. His mother stated that three weeks previously he had scarlet fever.

Œdema first appeared four days ago. On 13th September he passed about half-a-pint of urine in twenty-four hours.

September 14th. Slight œdema of face, desquamating all over, has only passed about two tablespoonfuls of water since last night. Ordered milk (half-a-pint) with water. Potass. bitart. ʒ j.; aquæ. ʒ xx. fiat. Potus.

15th. Pulse 60, very small, feeble, and irregular. Tongue moist, slightly furred. Has not passed any water since admission. Heart and lungs healthy on physical examination. No ascites. Intellect quite clear; very drowsy. No headache or complaint of any kind. Pulv. jalapæ. co. gr. xxx. statim.

16th. Pulse 68, same character as yesterday. Bowels not acted, but moved after enema of tepid water. No urine passed. Perspiring freely. Sick yesterday afternoon. Is very sleepy. Has had a pint of milk and the drink in the last twenty-four hours. No headache or other discomfort. At 1 p.m. he passed half-a-pint of clear urine (Sp. gr. 1015 acid, ¼ alb.), the first water he has passed since he has been in the hospital (fifty hours).

17th. He passed about a pint of pale straw-coloured urine in the last twenty-four hours. Sp. gr. 1011 acid, ¼ alb. Bowels have not acted. Getting hungry. Has had some beef-tea and

some bread and butter this morning. Pulse 72, still irregular, better volume.

18th. Fair quantity of urine. Sp. gr. 1015 acid, the faintest trace of albumen. Pulse 76, still irregular. Appears quite convalescent. Ordered tr. ferri. per. ℥x. ter die.

20th. Normal quantity of urine. Sp. gr. 1002 neutral, no albumen. Pulse 92, regular.

21st. Urine, sp. gr. 1004 neutral, no albumen. Pulse 116. Slight otorrhœa.

22nd and 24th. Urine, sp. gr. 1015, faint cloud of albumen.

29th. Urine, sp. gr. 1002 neutral, not a trace of albumen.

30th. Urine 1000, nearly colourless. After this date the urine increased to sp. gr., but there was no more albumen detected, and the boy was discharged on October 22nd quite well, he would have gone before had it not been for a troublesome attack of otorrhœa.

The points which are specially noteworthy in this case are:—1st. The long time which elapsed before the boy passed any water after admission, namely, fifty hours, and from his mother's account he had made very little before he came under my care. 2nd. The entire absence of any of the symptoms of uræmia in spite of the suppression of urine, which I attribute in part to the fact that all articles of nourishment, except a little milk and free supply of water, were withheld. 3rd. The rapid way in which the albumen disappeared; and lastly the low sp. gr. of the urine which was registered on several days.

I take this as a very fair illustration of the cases I have had under treatment, and as I was able to watch this patient more carefully than I could in dispensary practice, I feel certain that all the particulars recorded are absolutely true. In hospital practice it is comparatively easy to keep the patient on a particular diet, but, of course, when friends are about the sick-room it is impossible to say to what extent one's orders may have been transgressed.

If any one will take the trouble to compare the treatment of acute Bright's disease as laid down in the various text-books on the subject, he will be much puzzled as to what course he had better pursue, for "when doctors disagree who shall decide?" and it cannot be said in this instance "that in the multitude of counsellors there is safety." The great point of dispute is as to the employment of diuretics. Dr. Johnson, who is the great opponent of this plan of treatment, gives as his reasons that there is "first a morbid condition of the blood, which has excited disease in the kidneys, and that as a secondary consequence of the renal disease the blood has become contaminated by the retention in it of urea and other excrementitious matter," and he therefore advises that the kidneys should have as little

work to do as possible, and that the other excretory organs should be called upon to assist in carrying off the waste products to the utmost of their power.

His treatment consists of—1. Warmth in bed. 2. Diet. "The food should be scanty, consisting of gruel, arrowroot, milk, or weak broth." 3. The use of the warm water or the hot air bath, and antimonials to cause diaphoresis. 4. The bowels to be kept freely open. "The circumstances which indicate the necessity of additional remedies are a very scanty secretion of highly albuminous and bloody urine, with, occasionally, severe pain in the back, more or less pain in the head, some degree of drowsiness or delirium, at length, perhaps, convulsions or coma, or an alternation of these two formidable symptoms." For these he recommends cupping on the loins. As regards diuretics, he says: "I mention the subject only for the purpose of deprecating their employment."

Dr. W. Roberts, on the contrary, writes:—"Objections have been made, on theoretical grounds, to the saline diuretics (acetate and citrate of potash) in acute Bright's disease. Experience has proved, however, that they may be employed with great advantage. They become changed in the primæ viæ into alkaline carbonates, and these diminish the acidity of the urine and render it more bland, as it percolates the renal substance. —In a considerable number of cases of acute Bright's disease, coming under treatment early, I have obtained almost invariably the best results by the free administration of the citrate of potash." His treatment is as follows:—"An endeavour should also be made to allay the fever and restore the action of the skin, by a citrate of potash draught, given every two hours, in effervescence, or a mixture of the liq. ammon. acet. in two or three drachm doses, with fifteen drops of tincture of henbane in an ounce of inf. lini. The diet should be composed of light farinaceous substances with milk, beef-tea, and broths. Flesh meat in any form is objectionable in the early stages."

Dr. Dickinson bases his method on the necessity there is for an abundant flow of fluid through the kidneys to wash out the extravagant growth of epithelial cells and prevent them blocking up the tubes. "Hydragogue purgatives and vapour-baths, while tending comparatively little to remove the elements especially belonging to the urine, divert the water which is wanted for this purpose. Of all diuretics water is the most valuable. The patient may be restricted to a fluid, but nutritious diet, while pure water is taken freely. In children, when the kidney responds readily to this simple stimulant, the disease will generally recover without further treatment. In grown persons, or in children when the disease is severe, digitalis is a most valuable adjunct." He strongly condemns the employment of

hard purging and sweating, and he would reserve the repeated use of hydragogue purgatives for obstinate and hopeless cases only. Dr. West thus criticises Dr. Dickinson's treatment by the administration of a large quantity of water:—"Nothing whatever that was observed during its use among my patients at the Children's Hospital seems to justify one's regarding the drinking of two or three pints of cold water in the twenty-four hours as more than a useful adjunct to the treatment."

From what I have seen of this disease I am inclined to agree with Dr. Dickinson rather than Dr. West, but I cannot too strongly enforce the opinion of the latter as to the inutility of cathartics in the treatment of acute albuminuria; there is the risk of checking perspiration and thus throwing additional work on the kidneys, and sometimes obstinate diarrhœa is set up.

Dr. F. Roberts says:—"The most important object in treatment is to endeavour *to get the skin to act freely and persistently*," but goes on to say that the experience of many practical observers proves that some diuretics may often be given with great benefit.

Dr. Tanner, after quoting Dr. Johnson's remarks, already given, writes:—"Our double object must therefore be to rest the affected glands while we purify the blood by means of the other excretory organs," and recommends diaphoretics and free purging.

Dr. Copland advocates the employment of diuretics only after the more active symptoms have passed, and says:—"Of diuretics the nitrate, tartrate, or super-tartrate of potash, conjoined with nitre and the spiritus ætheris nitrici, are amongst the best," and he quotes M. Rayer's statement that "he has found a milk diet, continued for some days after the subsidence of the acute symptoms, of great service."

The authorities to whom reference has been made are sufficient, I think, to show the difference of opinion in reference to the use of diuretics in the treatment of acute Bright's disease, for while all are agreed that the more powerful and irritating drugs of this class should not be employed, some advise the use of the milder diuretics, whereas others say most emphatically "Diuretics are not to be given." The diuretics which are usually recommended as the least irritating are the sweet spirits of nitre, cream of tartar, and infusion of digitalis; if the stomach rejects the digitalis, an infusion four times the strength of the pharmacopœial one may be applied to the abdomen as a fomentation.

Dr. Southey attributes the success of the employment of the tartrate of potash in Bright's disease to the "abundant diuresis of alkaline urine;" and goes on to say, "I am speculative

enough myself to imagine that an alkaline fluid, passing through the urine tubes, has some similar action to that of weak soda or potash solutions upon sections of dead kidney-tissue under the microscope. I mean, that fat granules are saponified, cells rendered more translucent, the intestinal tissues become more loose, and the circulation is thus facilitated." It was some such idea as this which first induced me to try the plan of treatment I advocate, and the success attending it has induced me to call the attention of the profession to it, in the hope that a more rational plan of procedure may be adopted than the hard purging and sweating which is still too much in vogue. As a general rule, far too little attention is paid by the medical attendant to the diet of the patient, that is to say, the directions given are vague in the extreme, but in acute albuminuria, as in typhoid fever, any indiscretion in the food may be visited with the most severe punishment,—an attack of convulsions may be caused by excess in the first, just as I have seen perforation result from taking solid food too early in typhoid fever. I would sum up the treatment of acute Bright's disease in the following words:—

1. Milk and water with arrowroot, no solid food. 2. Mild diuretics, such as the citrate or bitartrate of potash with a free supply of water. 3. The skin kept just moist. 4. A daily evacuation of the bowels.—*Practitioner*, *Aug.* 1876, *p.* 101.

36.—ON THE DIURETIC ACTION OF THE RESIN OF COPAIBA.

By Dr. FREDERICK TAYLOR, Assistant Physician to Guy's Hospital.

[Attention was first drawn to the diuretic action of resin of copaiba by Dr. Wilks (*Retrospect*, vol. lxvii., p. 398).]

The notices which have already appeared from time to time on the use of the resin called forth a short paper on the subject by Mr. E. L. Dixon. He records three cases in which Durant's capsules of copaiba were exhibited with marked effect. In the first case, one of hepatic ascites, three capsules containing from five to ten minims each were given night and morning, and the daily excretion of urine rose quickly from 14 ounces to 60, 70, and 80 ounces. In a case of heart disease, with anasarca, the same dose increased the urine to 100 ounces, after the entire failure of digitalis, squills, spirits of nitre, and other diuretics; while in the third case, also one of mitral disease, with albuminuria and dropsy, the urine was at once increased in amount upon the administration of two capsules at night. The quantity reached 70, 80, and 90 ounces daily, while the albuminuria diminished and the ascites disappeared.

At the hospital the resin of copaiba has been administered in more than sixty cases. The present communication contains forty cases, some of which occurred under my own care, but the greater number under the care of my colleagues, to whom I am indebted for permission to publish the notes. In nearly all the cases dropsy was a prominent symptom; and this is what might be expected, when it is remembered that it is the condition in which the urine is most often scanty, and in which diuretics are most frequently indicated. All the important varieties of dropsy are represented, and the cases are classified according to the organ diseased; though in some the dropsy may have been the joint result of the morbid condition of two viscera. Thus, in one, dilatation of the heart was present with contracted liver; in others, advanced degeneration of the kidneys accompanied cardiac valvular disease.

The balsam of copaiba, as is well known, contains three chief substances—firstly, a volatile oil, the Oleum Copaibæ of the British Pharmacopœia; secondly, a small quantity of a brown, soft, or viscid resin; and thirdly, the substance in question, a hard resin, which has acid properties, and constitutes more than 50 per cent. of the oleo-resin. This acid, copaivic acid, is described by Pereira as amber-coloured, brittle, and crystallizable. Weikart states that the chemically pure copaivic acid is a chalk-white powder, scarcely soluble in water, with a bitter and acrid taste, though not so nauseous as the balsam or the oil. The substance supplied to Guy's Hospital is of a dark green colour, transparent in thin layers, brittle and resinous in consistence, almost tasteless, and with a faint odour resembling that of ordinary resin. It is soluble in alcohol, ether, and chloroform, from which it is thrown down on the addition of water; it dissolves in alkalies, and is separable from them again by acids. So far as this preparation is concerned, its difference from the acid as described by Pereira or Weikart is easily explained; it is the residue of the distillation of the Oleum Copaiba, and therefore, though consisting almost entirely of the hard resin, must still contain the other non-volatile constituents, such as the viscid resin, colouring matter, &c.

In our hospital dispensary, the resin is softened with about one-fourth of its bulk of rectified spirit, and thus converted into a viscid mass. Three ounces of this are rubbed down with four ounces of compound tragacanth powder, and mixed with four pints of water; one ounce of this mixture contains twelve or thirteen grains of the resin, and is given three times daily. The mixture forms a thick, whitish-green, opaque fluid, which deposits very slowly; being almost tasteless it is only unpleasant from the viscidity of the mucilage, and it

is probably to this that the nausea, which not a few patients experience, especially after prolonged use of the medicine, must be ascribed.

It will not be necessary in this place to say more than a few words on the general effects of copaiba, as they will be discussed more in detail in connection with each class of cases. As a result of its administration in favourable cases the quantity of urine is quickly increased at the same time that its specific gravity is much lowered. In illustration of the first statement reference may be made to Case 2, in which the quantity rose from 20 ounces on the day of administration to 40 ounces on the second day after, and 56, 60, 74, and 96 on the succeeding days: to Case 3, in which it rose from 21 ounces to 68 on the following day, and after this to 68, 80, and 90; and to Case 6, in which it rose from 60 ounces to 122 on the following day, and 116, 126, 148 and 140 on succeeding days. One of the most striking instances is Case 5, in which the urine measured 18 ounces on the day the drug was first ordered, and 76 ounces on the following day.

The condition of the specific gravity has not been recorded in all the cases, but in many in which it has been taken it will be seen that diminution occurred as a consequence of the employment of the medicine under discussion. Thus in Case 1 the density fell from 1010 to 1004; in Case 2 from 1030 to 1016 on the second day, and to 1010 on the third; in Case 4 from 1018 and 1022 to 1012 and 1010; in Case 21 from 1017 to 1010; and in Case 31 from 1026 to 1011. It is to be observed also that the action of the drug in both these respects is very rapid, and that one or two doses suffice to produce a considerable effect. The urine has been generally saved from 10 a.m. on one day to 10 a.m. on the following, so that the number against any date represents the quantity passed in the twenty-four hours ending at 10 a.m. of that date; if, then, the medicine is ordered as usual at the visit of the physician in the early afternoon, certainly not more than two doses will have been taken by the next time of collecting the urine. A few experiments made on the healthy individual exemplify this as well as the fall in the specific gravity, though they are scarcely complete enough to be conclusive. In one the specific gravity fell to 1010 two hours after taking the drug; and in another it stood at 1008 two hours and a quarter after a full dose, namely, three ounces of the hospital mixture.

The diuresis so rapidly produced may as quickly subside when the drug is withdraw; illustrations of this are not numerous in the cases reported, but may be seen in Nos. 15, 16, 18, and 29. In Case 16 there was a rapid fall from 80 ounces to 44 ounces; Case 18 from 110 ounces to 64; and in Case 29, when, on

the urine reaching 278 ounces, the medicine was omitted, only 74 ounces were passed on the following day.

One other fact in connection with the employment of copaiba, to which allusion has already been made, deserves some further notice. The urine of persons taking this drug yields a turbidity and precipitate on the addition of nitric acid, and Dr. Rees and others have pointed out the means by which this can be distinguished from the precipitate which the same acid produces in albuminous urine. The precipitate of copaivic acid is not in general difficult to recognise, but it will often occur that the patient to whom it is desired to give the resin of copaiba has already albuminous urine, and in such cases I have sometimes been uncertain of the presence of the copaiba, and certainly in one case failed altogether to find it. What practical bearing or diagnostic value such observations may have I am at present unable to say, and must leave for future inquiry to determine, but it appears at least possible that the passage of copaiba with the urine in one case, and its absence from the secretion in another, may indicate differences in the structural condition of the kidney. The amount of the resin which comes through in the urine was remarked by Weikart to bear a very small proportion to the quantity taken into the stomach; and the two experiments I have already mentioned pointed to the same conclusion, though undertaken for another purpose. This was to ascertain what time was required for the passage of the copaivic acid into the urine; and the experiments were made with the mistura copaibæ resinæ on the healthy individual. In the first an ounce and a half, containing about twenty grains, were taken three hours after a full meal; the urine passed after forty-five minutes gave no precipitate nor turbidity with nitric acid, but some passed after one hour and twenty minutes became opalescent on the addition of either acetic or nitric acid. The same reaction occurred with that passed two hours after, but not with the next instalment passed nine hours after taking the drug.

In the second experiment three ounces of the mixture were taken two hours after a full meal. The urine passed after twenty minutes, forty minutes, and sixty minutes, gave no reaction, but a turbidity was produced in that passed one hour and twenty-five minutes after the dose, and the precipitate was abundant in that discharged fifty minutes later. Twelve hours after taking the medicine the urine became only faintly opalescent on the addition of nitric acid, and it was not further tested.

Ascites from Disease of the Liver.—I have notes of 13 cases which fall under this heading. In one case (No. 9), that of a child, aged 6½ years, there was ascites with hepatic enlargement

of uncertain nature; in another (No. 4) the liver was altered in shape by a thickened and contracted capsule, and the heart was enormously dilated; in the remaining eleven the disease was ordinary cirrhosis of the liver. The influence of the resin on the child was not very marked; the urine was moderately increased in quantity, and the ascites gradually diminished. But in the case of capsulitis, and all the cases of cirrhosis but three (Nos. 11, 12, 13), the diuresis produced was very decided. The urine reached in different instances 80, 90, and 100 ounces, while its specific gravity was reduced to 1010, 1008, and even 1004. In these cases also the beneficial influence upon the ascites was also quickly observed, the abdomen soon becoming less tense, and then diminishing in size at the rate, in one case, (No. 1), of seven inches of circumference in eleven days, and in another (No. 5) of eight inches in eighteen days.

Of the three cases in which the resin failed to produce any effect one was already improving when it was administered (No. 12); paracentesis had been performed, and moderate diuresis kept up by digitalis, squill, and nitrous ether; no increase of urine was obtained from the resin, but the abdomen continued to diminish in size. In another case (No. 11) paracentesis was performed after a seven days' trial of the copaiba, but death followed in four days; while in the third case (No. 13) a slightly increased flow was the first result, but the great distension necessitated tapping, and the resin failed to act after this.

The results of the first ten cases appear to contradict very decidedly the assertion of Niemeyer, that diuretics are as useless as they are irrational in the treatment of ascites, especially in the form of ascites under consideration. "If the ascites," he says, "is the result of portal obstruction, they do no more good than they would in œdema of the leg from obstruction of the crural vein by a thrombus." But one can scarcely deny the very obvious sequence of cause and effect in these cases, so far, at least, as mere diuresis is concerned.

But the permanent benefit to be derived from the treatment might well stand in question some time longer, to judge alone from the cases here recorded. Excluding the case of the child (No. 9) as of doubtful nature, we find that in four cases (Nos. 1, 2, 3, 8) the subsidence of the dropsy was succeeded by fatal coma; twice accompanied by delirium, and twice preceded by more or less abundant hæmatemesis; and in an equal number only (Nos. 4, first illness, 5, 6, 7) was the ascites relieved without any untoward symptom. Of the three cases in which copaiba had little effect two were submitted to paracentesis, and died after a short time with coma and delirium (Nos. 11, 13), while I have references to three other fatal cases of cirrhosis of the

liver, not included in the present list, in which copaiba resin was given for too short a time to draw any conclusions from. Indeed, cirrhosis of the liver as it comes before us in hospital practice, in its advanced stage, with ascites fully developed, is a very fatal and intractable disorder.

The condition of the kidneys is of interest in a disease in which one looks to them for an increased performance of function; and it appears that in all the cases in which diuresis was effected, and in one of those in which it was not, the kidneys were practically healthy. I may refer to the notes of the anatomical condition of the organs in the fatal cases, and the observations on the urine in the cases which recovered. The exceptional cases are, No. 11, in which the kidneys were congested and weighed 19 ounces, and No. 12, in which the urine was, on admission, of sp. gr. 1014, and contained a trace of albumen.

Chronic Abdominal Effusion.—In the only case of this kind, in which the resin of copaiba has been tried, it proved to be of little value. On one day the quantity of urine was unusually high (76 ounces), but only on two other occasions was it more abundant than it had been before the administration of the drug. As no effect upon the effusion was perceptible, the medicine was discontinued after a fortnight's trial; and after the application of unguentum hydrargyri had also failed to bring about absorption of the fluid, the aspirator was used with complete success.

Cardiac Dropsy.—This group is especially interesting because the cases included in it offered numerous opportunities of comparing the relative effects of digitalis and copaiba. Often, indeed, they were given in combination, and in one case (No. 22), where this was the only medicine administered, the diuretic effect cannot with certainty be ascribed to either: in most cases, however, digitalis was given at some period, either alone or in combination with squill, nitrous ether, &c., and the advantage derivable from the addition of copaiba resin was very obvious. Instances of this may be seen in Case 17, where for the first *nine* days, during the use of digitalis, the daily urine averaged 23 ounces, but increased rapidly on the addition of copaiba resin to 90, 100, and 125 ounces, making an average of 77 ounces during the next period of nine days, or an average of 69 ounces for the whole period of 39 days; and in Case 16, where the urine increased to 110 and 120 ounces under digitalis and resina copaibæ, fell quickly to 40, 20, and 16, when the latter was discontinued, and rose again to 80, when it was again employed. Examples of the different effects of the two drugs, when given separately, are afforded by Case 15, where

digitalis was given at first with little relief, and by Case 21, if the middle period, June 2nd to June 8th, be compared with the period of eight days preceding it and that of thirteen days following it, though only during a part of this last was digitalis taken.

Of the fourteen cases included in this group of cardiac disease the diuretic effect was well marked in seven (Nos. 15—21): in two of these (Nos. 19 and 20) there is no record of the condition of the urine under other treatment than the copaiba resin; but in the five remaining cases the urine was measured for longer or shorter periods, while this drug was omitted or others were substituted for it. The influence of the resin is in this respect well shown in Case 18. On six days between March 9th and March 18th, during which he was taking copaiba, he passed respectively 100, 120, 110, 108, 104, and 110 ounces, giving a daily average of 110: on the eight following days he passed respectively 64, 60, 66, 40, 40, 38, 30, and 26 ounces, a daily average of 45; and on the next seven days, March 27th to April 2nd, he passed during the administration of the resin 44, 80, 100, 100, 110, 120, and 112, a daily average of 95.

Cases 21, 16, 15, and 17, have already been instanced as illustrating the same point; but the last mentioned deserves a closer analysis, as the observations made on it extend over a period of more than a year, during nearly the whole of which the urine has been measured, and the resin of copaiba has been repeatedly taken for several days in succession. The time of observation may be divided into eleven periods; of which five, during which copaiba was given, alternate with six in which it was omitted, and some other treatment was employed. As may be seen by reference to the figures, the quantities passed during a long period vary very much, and the fluctuations on either side of the average are considerable: but the difference between the averages of the various periods is too great to be compensated for by this fluctuation, except towards the end of the observation, where it will be seen that two of the means very closely agree. The periods during which the resin was *not* taken are:—the first, of 9 days, with an average of 28 ounces; the third, of 33 days, with an average of 34 ounces; the fifth of 14 days, with an average of 34 ounces; the seventh of 15 days, with an average of 31·4 ounces; the ninth of 23 days, with an average of 46 ounces; and the eleventh of 50 days, with an average of 21 ounces. The alternate periods during which copaiba was being taken are:—the second, of 39 days, with an average of 69 ounces; the fourth, of 25 days, with an average of 69 ounces; the sixth, of 38 days, with an average of 50 ounces; the eighth of 30 days, with an average of 56

ounces; and the tenth of 32 days, with an average of 47 ounces. They may be tabulated for comparison thus:—

Periods . . .	1	2	3	4	5	6	7	8	9	10	11	General average
Days . .	9	39	33	25	14	38	15	30	23	32	50	...
Without resin .	23	...	34	...	34	...	31·4	...	46	...	21	33
With resin . .	...	69	...	69	...	50	...	56	...	47	...	58

Of the remaining seven cases one (No. 22) has been already referred to as of doubtful value because the copaiba was given in combination with digitalis. In another (No. 23) the result was not very decided, but the medicine had to be administered in small doses on account of repeated sickness; and in the last five cases the drug appeared to have little, if any, influence upon the secretion of the urine. It must be confessed that in none of these have the results been so carefully watched and recorded as in the cases already considered; but the absence of record is of itself a kind of evidence that the quantity of urine was not increased in a striking degree. In two cases (Nos. 24 and 26) the patient was only for a few days before death submitted to the influence of the resin, and therefore one would hesitate to draw any conclusions from them with regard to its efficacy, but in the other three (Nos. 25, 27, and 28), as well as in one of the above (No. 26), a condition was present which at once suggests itself as a probable cause of the failure of the diuretic. All of these terminated in death, and in all the kidneys were found to be affected with Bright's disease. In Case 25 the kidneys were "very uneven on the surface, mottled, and evidently affected with advanced (fatty) degeneration." In Case 26 the surface was granular, and the cortex much wasted. In Case 27 they were slightly granular, presented an opaque yellow mottling, without wasting of the cortex; and in Case 28 they were very granular, with adherent capsule, wasted cortex, and many points of fatty inflammatory degeneration. These results may be compared with those of Case 15, where the kidneys were congested but apparently healthy; and of Case 22, in which they were only large, indurated, and glistening.

Renal Dropsy.—Considerable interest attaches to the cases forming this group in connection with the local action of the resin of copaiba; and the questions at once arise—firstly, whether it causes diuresis when the kidneys are diseased;

secondly, whether under the same circumstances it does any appreciable harm to the patient. In attempting to answer the first of these questions the variety of the Bright's disease must be taken into consideration, since the amount of urine usually secreted is different in different kinds, and even in different stages of the same kind of this complaint. The urine is not invariably scanty; it is abundant in stages of recovery of acute tubular nephritis, in the middle periods of the granular kidney, and in well-marked cases of lardaceous disease. Even in the later stages of the chronic fatty degeneration resulting from tubular nephritis I have seen a temporary improvement, marked by rapid subsidence of the dropsy, with a sudden increase of the quantity of the urine to three or four pints daily. But it is true, generally, that where dropsy is present the urine is scanty, and it is therefore chiefly in the varieties or stages characterised by these two conditions that a diuretic action would be desirable. The six cases here recorded include four varieties of disease, and therefore, though each case is more or less valuable in itself, there are too few of each kind to supply trustworthy evidence on the subject under consideration. The condition best represented is acute tubular nephritis, of which there are three cases (Nos. 36, 37, and 38); and there is one case of each of the following varieties of Bright's disease: chronic granular kidney (No. 35), mixed granular and fatty kidneys (No. 39), and lardaceous disease (No. 40).

The result of the first three cases above mentioned, all apparently unmixed cases of tubular nephritis, seem to point to the conclusion that in this affection, whether its early acute form or its latter stage of fatty degeneration, the administration of the resin of copaiba does not appreciably increase the quantity of urine. But it will be remembered that in the remarks on the cardiac cases it was suggested that the failure of the drug to produce diuresis in the last four cases (Nos. 25—28) might be in part attributable to this condition of the kidneys; and a reference to the post-mortem results, or to the summary given on page 26, will show that three out of the four presented mixed conditions of interstitial inflammation with fatty degeneration. With these last, so far as the kidneys are concerned, Case 39 may also be considered, making a total of eight cases in which the drug had no marked effect. Of these, four are cases of primary renal disease and four of renal disease accompanied by some affection of the heart.

There remain two cases upon which the resin does not seem to have been without influence; in neither, however, was the urine at the time scanty. In Case 35 the urine before admission is described as having been abundant, and it was found by measurement, prior to the use of the medicine, to be 68 and 72

ounces in the twenty-four hours; albuminuria was present, and the kidneys were presumed to be granular, though he had at the same time stricture of the urethra and was passing some pus in the urine. Under treatment the quantity rose to 80, 90, and 100 ounces. The second of these cases (No. 40) is a typical example of lardaceous disease of the kidneys; the patient was passing a sufficient quantity of pale, highly albuminous urine, which measured 50 ounces on the day before the mistura copaibæ resinæ was ordered; it rose then to 80, 90, and 100 ounces, giving an average of 91 for eight consecutive days, from the third to the tenth of the treatment.

The second question is more difficult to answer from the limited number of cases here recorded. There was no evidence that in any of the four cases (Nos. 36—39) positive harm followed the use of the resin. In Case 36 the height of the disease had been already reached, the dropsy was subsiding, the urine becoming more abundant, and the treatment offered no check to this favourable progress. In Case 38 and 39 the results appeared to be simply negative; but in Cases 37 it will be seen that during the employment of copaiba the urine actually became less in quantity, if one compares the average daily excretions at that time with the average daily flow during any corresponding period afterwards, or during the whole time from the discontinuance of the medicine until death. The mixture was taken for ten days, and the average number of ounces for the six days on which the urine was measured is 35; the next six days give an average of 52; the next six, of 34; the next six of 44; the next six, of 56; and the last seven, of 48. The whole period of thirty-one days during which no copaiba resin was taken yielding a daily average of 47.—*Guy's Hospital Reports*, 1876, *p.* 1.

SURGERY.

FRACTURES, DISLOCATIONS, AMPUTATIONS, AND DISEASES OF BONES, JOINTS, ETC.

37.—ON FRACTURES OF THE THIGH.

By J. Cooper Forster, Esq., Surgeon to Guy's Hospital.

The term used at the heading of this paper is not intended to include the features or treatment of all fractures of the thigh; those of the head and neck of the bone, and of the condyles or about the knee-joint require separate consideration, as they have special treatment; the former, by reason of the nature of the fracture, the age of the patient, and the implication of a joint; the latter, because of the injury to the knee and the imperative necessity to attend to the perfection of after movement of the joint rather than to the position of the fragments of the bone. Few points have been more hotly contested in the practice of surgery than the question of the treatment most applicable for the prevention of shortening in fracture of the shaft of the femur.

Now the flexed and the straight positions of the limb appear obviously to be antagonistic. The one is, as has been said, the principle of muscular relaxation; the other is that of immobility of the joints into which the broken bone enters. The former aims at getting the limb into a good position; the latter takes chiefly into account the processes of repair, and, recognising the fact that Nature, if let alone, does very well, and if hindered, is proportionately liable to fail in her operations, lays predominant stress upon the principle of *rest* as the one thing to be insisted on. The surgeon cannot repair the bone, but he can remedy the displacement. Now, taking these two methods on their merits, it seems sufficiently obvious that the application of a long straight splint to the limb is the more scientific, for the principle of muscular relaxation may well be called the "let-alone" method, the fractured ends of the bones being subject to disturbance by the flexion of the joint which it in part forms; while *rest* is of such importance that any other detail, though it may be acknowledged to be of great value, yet must take a second place. With the long straight splint the muscles, no doubt, are frequently anything but relaxed, but inasmuch as the hip and knee-joint are thereby kept steady, it has been very generally, except in special cases, preferred to the other.

It would thus seem, then, that each method has advantages peculiar to itself, and it doubtless has suggested itself to many minds to endeavour to combine the two, so as to make use of the advantages of both methods, and yet eliminate any parts of the one treatment which militated against the action of the other. It is indeed in this direction that efforts have of late years mostly been made in the treatment of fractures. Muscular relaxation is certainly of cardinal importance, if it can be obtained in association with fixity of the joints. But muscular relaxation must be supplemented by some amount of extension. The requisites of a scientific treatment of fractures are not satisfied unless this be obtained; and thus it has been proposed to secure, in addition to rest and muscular relaxation, a certain amount of so-called permanent extension. The necessity of *continuous* extension is so obvious, that when once it has been suggested, every method must provide for its application, at any rate in semblance, or else it would be condemned. The straight splint, as formerly applied by Desault, only gave it this semblance of continuous extension, for the maximum extension was applied at once by the perinæal band, and soon became too little for the stretched but yielding tissues of the limb. The double-inclined plane also gave it only in semblance, for the extension was theoretically made by fixing the knee at the apex of the double incline, while the weight of the body dragged the upper fragment downwards towards the buttock; nevertheless in practice it was obvious that the buttock generally passed upwards on to the incline, in place of dragging the limb downwards, and thus all extension was removed.

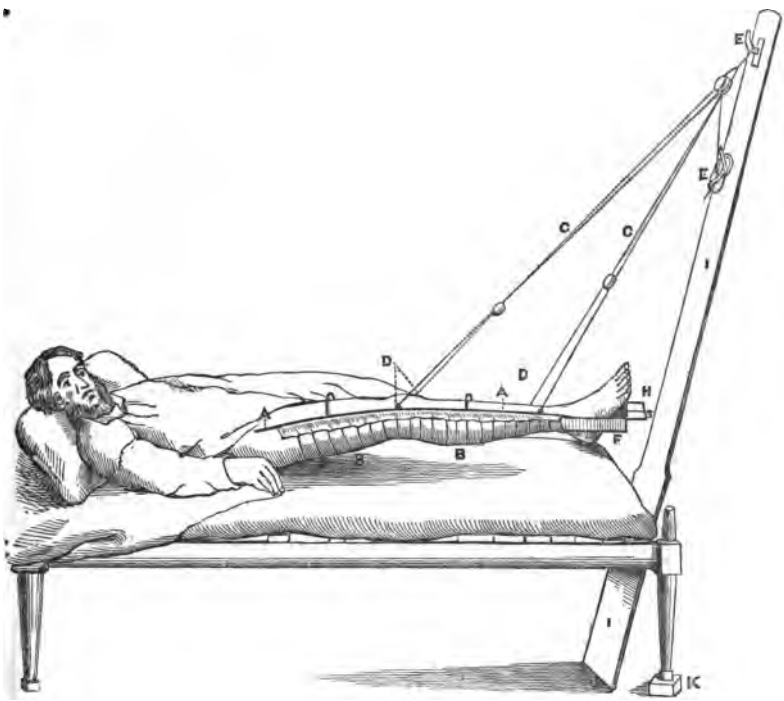
My old master, Aston Key, found this out, and resorted to the straight splint from the incline, thus tacitly confessing that of the two the straight method was the better,—an opinion shared by all who had any experience in the matter. The next advance was the further pursuance of the same principle by the addition of weights to the long straight splint—an advance, without doubt, on the previous treatment, and a plan I have myself very extensively adopted during the last few years. Latterly, many surgeons have been disposed to rehabilitate the inclined plane, only with more perfect recognition of the insufficiency of the old apparatus to carry out the necessary requirements, and by adopting the principle of continuous extension by means of pulley and weight have insured that the body shall make, as it did originally only nominally, some effective counter extension upon the upper fragment, and thus to a certain extent steady the bone while retaining the two ends in apposition.

Imbued with some such general ideas as these it would not be difficult for any one to suggest a form of splint which should

fulfil the various requirements I have named, and which should be a model of the most approved form of splint in vogue at the present day for fractures of the shaft of the femur. It must be one in which the muscles of the femur are in a state of relaxation, therefore it must be a splint in the form of a double incline plane; it must be one which carries out the principle of rest, and this can only be attained if the limb is flexed by considerable traction upon the muscles. Therefore, it must be some apparatus which allows of a continuous pull upon the limb, which can be increased according to necessity. These requirements are fully carried out by a splint devised by Dr. Nathan Smith. It is thus described by Hamilton:—"It is simply a frame composed of stout wire and covered with cloth, which being suspended above the limb allows the limb to be suspended in turn to it by rollers, the rollers passing around both limb and splint from the foot to the groin. Wire of the size of No. 10 bougie is usually employed. The length of the splint should be sufficient to extend from above the anterior superior spinous process of the ilium to a point beyond the toes, the lateral bars being separated about three inches at the top and one quarter of an inch less at the lower extremity. In the case of a broken thigh, the upper part to which the cord for suspension is to be fastened, ought to be nearly over the seat of fracture, and the lower part should be placed a little above the middle of the leg." The method of suspension as shown by Hamilton differs a little from that I have been in the habit of using, and which I have taken from the plan adopted by Mr. Johnson Smith, Resident Surgeon at the Seaman's Hospital, at Greenwich. It does not, however, differ materially from the plan originally proposed, and consists, as shown in the drawing, of an upright fixed at the end of the bed, to which the limb is slung obliquely by means of a cord and pulleys. A modification of Nathan Smith's splint has been proposed by Hodgen, which seems to me better than the original, and it is this which is figured in the plate. Instead of fixing the splint on the anterior aspect of the leg, a cradle is made of it by attaching transverse bands of calico or bandage, and the limb is laid upon these bands, a stirrup having first been attached to the leg and foot, which is afterwards fastened to the foot piece of the wire cradle. The cords for fixing the leg to the upright are attached to the cradle, which in its turn makes traction on the leg by means of the stirrup.

It may be said, in passing, that though the splint applied as now described is a modification of Nathan Smith's, the method of application somewhat alters the principles of treatment. Nathan Smith, by applying an anterior splint closely to the leg, does in fact supply an artificial bone in place of the fractured

one, which temporarily, so to speak, directs the action of the muscles and obviates their tendency to drag the fragments out of position—a most philosophical and ingenious practice. Hodgen, by placing the limb in a posterior cradle, adopts the old principle of rest in association with the swing. There is also this further difference, that the anterior splint goes above the hip and fixes that joint, while Hodgen's leaves it free to



A. Wire frame.
B. Folds of linen converting the frame into a cradle.
C C. Suspending cords and pulleys attached to the cradle at D D, and fastened to the upright at E.
F. Strapping stirrup fastened to the leg, and from which extension is made, fixed to the cradle at H.
I I. Upright.
K. Block to tilt upwards the foot of the bedstead.

move. The reason that induced me to adopt the latter, apparently in contradiction to the soundest principles of surgery, was, as I shall explain below, that upon a review of all the methods that have ever been suggested, each appears to give very similar results, and Hodgen's splint is, it appears to me, undoubtedly the one which gives most comfort. It will be observed that this apparatus is somewhat similar to that more commonly adopted, viz. the simple application of the weights. It is necessary in the application of that plan to apply a long outside splint to keep the limb steady; but as regards the traction it is not necessary. The differences are these, that the simple weights are a movable and constantly acting force, whereas in the Hodgen's splint the fractured extremity is the fixed point. Then the extension by weights is made in the same horizontal plane as the recumbent body; in Hodgen's splint the traction is as in an inclined plane. The former has to make allowance in applying extension for an amount of friction which can hardly be estimated, but which goes far in many cases so to neutralise even the extension of a heavy weight, that it has often happened to me to see twelve, fourteen, or even twenty pounds applied to a patient's limb, and yet no particularly excessive pull complained of,—a perfectly unnecessary weight, I need hardly say, if the whole amount were telling on the limb; nay, more, a weight sufficient, if in complete action, to cause considerable pain to the patient, and even some injury to the tissues. All this is obviated in the sling plan. The limb is fixed at an angle, and away from the bed, so that whatever pull is made acts strongly upon the member without waste of force. But after all, the test of the efficacy of any one plan of treatment will still be to many surgeons (though not to the most experienced ones), how much shortening does it leave under careful attention? Up to the present time, and in the case of all hitherto suggested splints, the answer always given to this question by many unbiassed observers has been, that no matter what the splint, the shortening will be about an inch, if the fracture occur in an adult and is not a transverse one. Occasional exceptions to this will be found, but so exceptionally that they may readily be explained by supposing that in such instances the fracture has been transverse. It is true that many great authorities have stated that there need be no shortening after fracture of the thigh. Desault, South, Amesbury, and others, for instance, distinctly state that judicious management will prevent shortening; but these gentlemen had each and all of them a particular form of splint to which he was wedded, and cannot, therefore, be received as *ex parte* observers. On the other hand, we have Mr. Holthouse examining all the fractures which he could find in the London

hospitals, and of fifty cases, all were shortened except three, and it is doubtful whether the measurements of the exceptions were correct. We have Dr. Warren, quoted by Hamilton, writing: "I have never yet seen, either in Boston or elsewhere, after a long and very careful examination, an oblique fracture of the thigh in a patient over seventeen years of age in which there was not some shortening." He adds, very significantly too: "I have had cases shown to me in which it was averred that the limb was not shortened, but on measuring myself I have found the fact otherwise."

On this point no more need be said, than to refer to the tables which are given at the end of this paper. From these it will be seen that forty-seven cases treated by various plans—inclined plane, weights and long straight splint, the limb simply flexed, and lying on the affected side—the average shortening amounted to three-quarters of an inch. In a second table seventeen cases are given, in which the fracture has been treated by what I have described as theoretically the most perfect splint yet devised. The shortening in these instances amounted to the very inconsiderable average of one-third of an inch. It would appear, therefore, from these figures, that what is conceived as theoretically correct, has been found in practice to be actually so. Notwithstanding these figures, however, I am not disposed to depart from the view I have previously entertained and expressed, that on a review of an extensive number of cases no one plan, in the long run, will give better results than another. These seventeen cases, on examination, are perhaps not so very far more favorable after all. Eight out of the seventeen were patients of fourteen years and under. This is, of course, an age at which it is generally admitted that under any careful treatment but little shortening results; of the other nine, I think it would be more fair to say nothing, but leave them till a larger number shall have proved or disproved the greater success of this form of splint. Until this is so, I shall continue to think with the latest writer on the subject, Mr. Holmes, that "if they [the limbs] are measured with perfect accuracy, a shortness of *at least* [the italics are my own] half an inch is ordinarily found in the adult." When this has been said, however, it still remains to be noted that this plan of treatment is the most comfortable to the patient, and, on the whole, gives most freedom of body-movement with least disturbance of the fracture. It also allows of greater cleanliness, which is of all the virtues next to godliness, especially in an hospital.

It is usually the case that any departure from simplicity in the apparatus employed in surgical practice is likely to be followed either by the discarding of the plan of treatment or else by its inefficient application and therefore failure. Hodgen's

splint forms no exception to this rule. There can be no doubt that its application requires a little more thought and dexterity than Desault's; and then again, in country practice, there may, and probably would be, a difficulty in obtaining the materials for fitting it up. It may even be thought by many that the result is not proportionately so successful as to make up for some amount of additional trouble. But, after all, the galvanized iron cradle can be made at any blacksmith's, and pulleys, cord, and an upright piece of wood are all that are then necessary. With these materials it will not be much labour to any one with an ordinary amount of energy to fit it up.

Of other disadvantages, I at present know of only two: one is, that the extension by the body on the fracture is so effectual that if care be not taken in the application of the strapping around the leg, below the lower fragment, which is in reality the fixed point, excoriation may take place, the strapping cut into the skin, and a troublesome sore result. Such an accident is familiar to all who have had much to do with the surgery of childhood in applying extension in hip-joint disease, but it is not necessarily absent even in the thicker skin and more forcible circulation of the adult, and in one case has actually happened.

The other possible disadvantage is the eversion of the lower fragment with the whole of the foot. This is not troublesome in the case of the long splint, but when the limb is swung, requires careful attention, as it may easily occur, and union then take place in a very awkward position.

Some little care must be exercised in so adapting the bandages upon which the thigh rests that they reach beyond the upper fragment. If this is not done, some bowing may result, notwithstanding the perfection of the extension applied.

It has been a question with many, whether there is any real disadvantage in a little shortening. It may therefore be well to state that an inch difference between the two limbs is a matter of very little moment to the patient. With this amount of shortening all ordinary locomotion can be performed without any inconvenience and with hardly a noticeable limp. It is well known that in the shortening produced by old hip disease, which is far greater than ever results from fracture, very good power of movement is retained by an accommodating curve of the pelvis and spine. The same thing also happens in the case of fracture of the femur.—*Guy's Hospital Reports*, 1876, *p.* 117.

38.—CASE OF TRANSVERSE FRACTURE OF THE PATELLA, TREATED BY A NEW METHOD.

By Dr. W. T. Grant, Royal Infirmary, Edinburgh.

Two years ago, when reading over the subject of fractures in the systems by various authors, I was much struck by the

unanimity of opinion regarding the character and amount of union taking place in transverse fractures of the patella, the general opinion apparently being, that true osseous union rarely or almost never takes place, and that if the permanent separation of the fragments does not amount to more than quarter or half an inch the case may be considered to be a fairly good one. Some authorities, again, as Mr. Adams, seem to consider that even direct ligamentous union is rare, and that more commonly we have it occurring by connexion of the fragments through the fibrous capsule of the joint becoming thickened, this also being incorporated with the bursa in front. Mr. Spence, in his systematic work, doubts very much the wisdom of attempting to obtain direct union, owing to the amount of force required to get the fragments together, and also the early stage at which it must be applied; and he specially advises less active measures in cases where there is much bruising.

Considering that this rarity of bony union is not due to any peculiarity or absence of nutrition in the part, but to mere want of close apposition of the fragments, I thought that if some steadily applied but moderate force could be brought to bear on the upper fragment the desired end might be obtained.

After a few experiments I found the following method apparently very applicable and simple. Unfortunately, however, not till this summer had I fair opportunity of testing its results. The case below will perhaps best show its principle and method of applicaton, which, with very slight modifications, is what I had previously used on the dead subject:—

J. R., æt. 56, labourer, was admitted to the surgical wards, Royal Infirmary, 7th August, 1876, suffering from transvere fracture of the patella, the result of indirect violence, there being also bruising of the knee on which he had fallen at the time of the accident. After an interval of two days to let the swelling subside a little, under Mr. Bell's sanction the limb was put up in the following manner:—

The leg was placed on an inclined splint, extending from the heel to near the gluteal fold; the lower fragment was then firmly fixed in position and steadied by a strap of plaster passing right round the leg; a semilunar splint of Hyde's poroplastic material was now carefully modelled to the thigh, just above the margin of the upper fragment, and this held in position by two stout pieces of strapping, the whole being surrounded by a few turns of a convergent spica bandage.

After allowing the splint to "set," I now took two steel hooks (about the size of those used by Malgaigne) and fixed them firmly into the splint, one on each side of the patella, the hooks being connected with a steel chain about three feet long; this was attached to the ordinary pulley-extension apparatus

with a weight of nearly 4lbs. On allowing this to act, the upper fragment was at once felt to be drawn closely down, while the lower remained in position, and after twenty-four hours the approximation had so gone on that only with difficulty could the line of separation be felt; now it is just recognisable by a line of thickening running across the bone. The patient suffered no discomfort, except at first a sense of dragging, which soon passed off.

This method seems to me to present the advantage of being comparatively painless, while exact apposition of the fragments may be obtained by the use of a moderately applied force, which is not so great as to inconvenience the patient by pressure on the joint or by limiting movements conducive to comfort in bed.

Since using the above, I am glad to see in the August number of the Dublin Journal that Dr. Hornbrook, in America, has been using the same principle of continuous extension by means of straight strips of plaster passing above the patella, with which he has got excellent results, bony union being obtained in all his three cases.—*Edinburgh Medical Journal, October* 1876, *p.* 317.

39.—COMPOUND FRACTURE OF THE PATELLA.

By Dr. JOHN M'DIARMID, lately Assistant-Physician, Perth District Asylum, Murthly.

Compound fractures of the patella are rare injuries, and happily so, for not only are they troublesome to treat, but if they do not cause death they generally do not give very satisfactory results. The grave character of this form of injury is shown by the fact, that of 69 cases found described in medical literature, home and foreign, by Mr. Poland (*vide* Medico-Chirurgical Transactions, vol. liii.), 14 died. Yet this writer is of opinion that the mortality is even greater than it is as shown thus, "because it is the successful cases which for the most part find their way into the public journals." That the majority of the recoveries is not of a very satisfactory kind is proved by 17 only of the 55 recoveries having perfect mobility in the affected joint. Of the remaining 38, 8 had partial and 20 had complete ankylosis. In other 4 cases of ankylosis, the exact state is not described. In 4 cases, secondary amputation was found necessary. In 43 of the 69 cases, suppuration, in the greater number profuse, occurred. The dangers which accompany the lesion are irritative fever, violent inflammation of the joint with ulceration of the covering cartilages, secondary abscesses, and pyæmia, the latter having occurred in 7 or 8 cases. Atrophy of the limb often supervenes, and painful adherent

cicatrices are not unfrequent. Even with antiseptic safeguards, such an experienced surgeon as Mr. Pick is satisfied with ankylosis after secondary abscesses along the thigh (*vide* Brit. Med. Journal, 16th October, 1875). The aims of the surgeon are to prevent inflammation of the membranes and cartilages of the joint; to get osseous union of the fractured bones where possible, and, if osseous union is not obtainable, to get short fibrous approximation of the broken fragments. If firm and short union can be secured with a movable joint and useful limb, good and well; but more frequently one must be content with saving the limb with the knee-joint in a condition of firm straight ankylosis.

How a movable joint was obtained with very little constitutional disturbance, and with scarcely a trace of pus, in a patient of the untoward age of sixty, and labouring under the grave complication of acute mania, I shall endeavour to describe.

J. B., a female, aged sixty, was admitted into the Perth District Asylum, Murthly, on the 12th of May, 1875, labouring under an attack of acute mania, and having compound comminuted fracture of the left patella.

For several years she had been a tippler, and about the beginning of 1875 she became very intemperate. Drink is supposed to have been the exciting cause of the insane attack.

The occasion of her receiving the injury was leaping out at a window two storeys high, and falling among some old iron, striking her knee against the edge of a cartwheel tire.

On examination (twelve hours after the occurrence), a wound two and one-half inches long was found stretching transversely across the front of the knee and opening into the joint. The patella was found divided across, the lower fourth being splintered into fragments, and the ligamentum patellæ completely divided. Several small fragments were found loose in the cavity of the joint, and removed by Dr. M'Intosh, while some splinters which were attached were allowed to remain. Two small scalp wounds (self-inflicted by an iron instrument) were discovered, and the legs exhibited numerous ecchymosed patches.

Generally, the patient was of good consitution, being of powerful muscular build, and with healthy internal organs. The pulse was, on admission, 100 per minute, full and bounding. The tongue was dry and furred, the bowels constipated, and she had considerable thirst. She was excited and delusional, but lay quite still in bed.

The edges of the wound were washed with cold water to remove the encrusted blood, and a piece of lint dipped in carbolic oil (1-20) was laid over the knee. The limb was laid on a padded Gooch splint, extending from near the fold of the nates

to beneath the belly of the calf, and secured by slip-knot bandages.

She had a strong dose of castor-oil before admission. Strictly farinaceous diet was ordered.

At 9.40 p.m., as she was rather restless, and complained of severe pain in the injured knee, $\frac{1}{15}$ gr. of the acetate of morphia was injected subcutaneously. Shortly afterwards she fell asleep, and continued in slumber for more than eight hours.

She remained drowsy all the following day and slept much, feeling no pain in the affected knee, which was much discoloured and full of fluid. Cold lotions were applied, the wound itself being protected by lint saturated with carbolic oil. The opiate was repeated at night, and she slept until next morning.

On the 14th, she was drowsy, and slept for considerable periods, the knee being only slightly uneasy. On the 15th, the knee was swollen, hot, and tender, and towards evening became painful. The evening opiate was increased to $\frac{1}{4}$ gr. Next day the inflammation had greatly subsided, there being free blood-stained sero-synovial discharge from the wound, and she suffered very little from pain.

Until the 19th, she had morph. acet. $\frac{1}{4}$ gr. injected every evening, with the invariable result of tranquil nights and days free from pain. She continued to do well, suffering very little, sleeping pretty soundly, and taking food well, until the 24th, when she complained of severe headache, and was ordered a dose of pil. col. c. hyoscy. for constipation.

On the 26th she was much out of sorts, having a hot skin, a pulse of 112, high and bounding (the usual rate being 72 to 90 per minute). The features seemed pinched, and she complained of pain in the knee and heel. The splint was found to have slipped down to the heel, and on being removed was discovered to have caused some abrasion. On the splint being padded afresh and readjusted she felt much easier, but had an unmistakable rigor in the evening. Next morning the cause of those unpleasant symptoms was found in an abscess in the right forefinger in connexion with necrosis of the ungual phalanx, the result of an old whitlow. Evacuation of the pus and removal of the bone gave much relief, and next day all the disagreeable phenomena had disappeared.

[The subsequent history of the case was very favourable. On the 9th October the report is that the patient could walk up and down stairs without difficulty, the limb being able to be bent at the knee almost to a right angle.]

Of all the remedies used the hypodermic injection of morphia was perhaps the most potent in subduing the tendencies to and first inroads of inflammatory action, and in assisting the efforts of nature in keeping the injured and neighbouring parts in a

healthy state. The most marked effect of the opiate was the causing of sound and prolonged sleep, which was of supreme importance to the nervous system of the patient, exhausted as it was with irregularity of living, want of sleep, and the restlessness of excitement. Then, by its analgesic properties, morphia so soothed the local irritation, that the patient was only very slightly uneasy from pain (for the most part), being able to lie quietly, instead of being restless from acute suffering. The general depressing effects of pain were avoided by the action of the drug, and the sufferer was kept during the first week in a condition of calmness of mind and repose of body, by day and night, which must have proved salutary. Ludwig and Lovén have discovered that irritation of a sensory nerve leads to the suspension of the action of the vaso-motor centre "in the part supplied by the nerve, and in those which immediately adjoin it, so that their vessels become dilated, while, at the same time, contraction of the vessels in other parts of the body is produced. The blood-pressure is thus increased generally, and produces in the locally dilated vessels a very rapid stream of blood."—(Brunton.) But morphia prevents this reflex action from an irritated sensory nerve, and is antagonistic to pain by acting "not only, in all probability, upon the encephalic centres, but by its effects upon each nerve-fibril along which the pain-producing impression travels, and upon every nerve-cell through which the impression passes." (Brit. Med. Jour., 1st Jan., 1873.) We may have thus an explanation of the fact discovered by Brunton, that opium limits to a marked extent the vascular congestion in a part where inflammation is being artificially produced. The manner in which the opiate subdued the inflammatory tendencies of the injured structures, while relieving the pain, is obvious, if we view the action of the drug in connexion with the physiological facts just stated.

It may also be mentioned that Professor Gross, of Philadelphia, U.S.A., states that venesection, followed by subcutaneus injections of morphia, is the best method of preventing muscular spasms in injuries to joints. The question of how far the hypodermic is superior to the stomachic administration of morphia is not suited for discussion here, but evidence is not wanting to show that the former interferes with the digestive processes to a much less extent than the latter mode.

Diet is also an element of importance in the treatment both of injuries to joints and insanity. In the former class of diseases, a stimulating diet would be hurtful, by exciting too much activity; while to the insane condition a lowering diet would be equally injurious, by depressing an enfeebled nervous system. Both dangers were avoided by a light, easily-digested,

but yet nutritious dietary of milk, eggs, and farinaceous materials.

Another point which deserves mention is, that some surgeons have employed and recommended pressure on the tissues near the joint, or on the femoral artery, to prevent congestion, effusion, and swelling. Ice has been employed for a similar purpose by others. (*Vide* Med. Times and Gazette, 1869, vol. i., p. 312.) A more rational method surely is to act on the circulation through its regulating nervous system, as we thus avoid the pain and inconvenience of such heroic local measures as compression. Besides, the less we interfere directly with the joint the better. Let absolute rest be secured, and the wound kept clean and free from dust or other irritating agents, and gentle general remedies are sufficient, with the *vis medicatrix naturæ*.

In one slight particular much mischief is in all probability frequently done, viz., by drawing the edges of the wound closely together by stitches. As Professor Lister has found in his operations opening into joints, a large incision is always a safeguard, by allowing free exit to synovia and pus. In the case described, the sero-synovial discharge was so great that much harm would have been done had it been pent up by stitches, as the tension thus caused would probably have led to such irritation as would have destroyed ligaments and cartilages. By confining the discharge, neighbouring tissues become infiltrated with it, to the danger of their vitality, ligaments are softened and stretched, and the fractured fragments are separated, to the great risk of their imperfect union. For similar reasons, forcible approximation of the fragments should not be attempted for the first few days. Taking all circumstances into consideration, there is, I believe, sufficient reason for doubting the truth of the dictum of surgical authorities that immediate amputation is the only proper way of treating compound fractures of the patella. (*Vide* Erichsen's Works, vol. i., p. 297.) Such a summary means of dealing with the injury seems rather barbarous in the present condition of medical science. At least in country practice, and in well-ventilated, healthy institutions, such as modern asylums, where "hospitalism" is neither a danger nor a bugbear, it would be monstrous malpraxis not to give the sufferer the chance of escaping with a serviceable, even although a stiff limb. And perhaps the dangers attending the lesion may prove, with antiseptics and judicious constitutional treatment, to be less than those concurrent with and subsequent to amputations. Professor Lister's success with operations involving joints, and Volkmann's (*vide* Edin. Med. Jour., March, 1875) with two cases of compound fracture of the patella, seem to be opening

the way for a rational, conservative, and successful mode of treating the form of injury discussed. — *Edinburgh Medical Journal, Oct.* 1876, *p.* 309.

40.—ON THE TREATMENT OF COMPOUND DEPRESSED FRACTURES OF THE SKULL.

By SAMPSON GAMGEE, Esq., F.R.S., Edin., Surgeon to the Queen's Hospital, Birmingham.

Is the trephine to be employed or not in compound fractures of the skull, with depression? No question more than this has engaged the attention of practical surgeons; it is still unsettled, and I shall endeavour to lead you to a correct understanding of its merits in commenting on three cases which I have to bring before you. In each case the scalp was divided, and the bones of the skull were broken and driven in, without, however, producing evidences of injury to the nervous centres. In none of the cases was the trephine employed; in all the result has been perfectly successful.

The man before you, Thomas Moran, a bricklayer's labourer, aged 55, was admitted to ward 3 on September 15th. While he was at work just previously, a brick fell from a considerable height upon his head, making a Y-shaped scalp-wound about two inches and a half in length, and situated rather above the middle of the left parietal bone. The flap of the wound being turned back, a Y-shaped fracture became visible, with its centre depressed to one-third of an inch; the sides of the fracture sloping evenly towards the central and most depressed point. The man seemed little affected by the accident, and had no idea of its serious nature. The edges of the wound, admitting of easy approximation, were brought together and dressed with dry lint; and for the first fortnight the patient was kept perfectly quiet in bed, on milk diet, with an ice-bag on the head, No signs of constitutional disturbance appeared, and the man was discharged at the end of seven weeks, to use his own terms, "in as good health as ever he was in his life." The wound was then quite healed, and the area of the depressed bone measured one inch and a half longitudinally, seven-eighths of an inch transversely; its depth was three-eighths of an inch in the centre.

The next patient, Henry Hadden, a machinist, aged 25, was admitted into the Queen's Hospital at 11.20 p.m., on September 25th. A few minutes previously, in a street row, a brick had been thrown at his head, producing a wound an inch in length, over the left temporal ridge, in a line above and in front of the ear. The hemorrhage was considerable. The probe

passed into a very abruptly punctured fracture of the skull; the amount of depression being half an inch, and the edges on one side at least, being quite perpendicular. Mr. C. W. Keetley, our house-surgeon, to whom I am indebted for the notes of these cases, made a memorandum at the time, to the effect that, in Hadden's fracture, a small piece of bone appeared to have been driven right in. The man was quite sensible, though faint from loss of blood. He was put to bed, with an ice-bag on the head. At 8.30 next morning, a little headache was complained of; the pupils were even; temperature 101 deg. A magistrate took the depositions at the bed-side in the afternoon.

[This man made an uninterrupted recovery. No treatment being adopted except the ice bag applied to the injured part. In a second case of depressed fracture caused by a brick falling upon the head, the same treatment was adopted and the patient made a rapid recovery. The depressed bone, which was one-eighth of an inch below the surrounding surface, was not interfered with.]

This patient continued perfectly well, and for the last month had acted as assistant porter in the hospital. He was now discharged, and I made the following note. "The length of the cicatrix is one inch and three-quarters. The depressed portion of bone measures one inch and one-eighth, by seven-eighths of an inch. The depression is deepest in the centre, where no bone can be felt. The man looks perfectly well, and says that he is so."

You have here three cases of compound depressed fracture of the skull, admitted within a period of one month, treated successfully, without the trephine or elevator. You may form some idea of the interest attaching to these cases, by a statement of Erichsen, that, with a single exception, he does "not recollect ever having seen a case recover, in which a compound depressed fracture of the skull occurring in the adult had been left without operation."

Prescott Hewett's counsel is given in no doubtful terms. "What," he asks, "is to be done, supposing there be a wound leading down to the bone in a depressed fracture of the vault without symptoms? The rule is that we are to operate and at once." With the utmost regard for this dictum of one of the most thoughtful surgeons of our time, who has made injuries of the head the special object of his clinical studies, and conceding that, in his advocacy of operative interference in compound depressed fractures of the skull, Prescott Hewett is at one with many eminent surgeons, especially British, I am clearly of opinion that the practice followed in the cases before you should be the rule of practice.

When addressing you on the treatment of compound fractures of the limbs, I have sought to impress upon you the wisdom of the precept, "to aim at reducing a compound to the condition of a simple fracture, and to treat both alike." This precept is equally applicable to compound depressed fractures of the skull, when the brain is not injured.

Although unanimity has not yet been attained, the progress of surgery has powerfully contributed to the establishment of this proposition. A century ago, operative interference was the rule in all fractures of the skull. It was Quesnay, himself an advocate of the practice of interference, who gave force to the opinions of dissentients, by the very title of one of those masterpieces of clinical study embodied in the memoirs of the old Academy of Surgery. It fell to the lot of another of the academicians to substitute for traditional empiricism rules of practice as prudent and safe in their application, as their conception was enlightened and their demonstration closely and carefully reasoned. With few reservations, Desault was opposed to the use of the trephine in fractures of the skull. It was otherwise with his great rival on this side of the Channel, Percivall Pott. The elevator and trephine were his favourite instruments, and so great was his ascendancy in the surgical world, so much more fascinating for the multitude, then as now, were boldness and complication than prudence and simplicity, that his heroic action had many imitators; foremost amongst whom was his most illustrious pupil John Hunter, who went so far as to advocate the trepan in some doubtful cases, "as the operation can do no harm." The impending French Revolution, and its attendant slaughter on the battle-fields of Europe, was soon to furnish those lessons which, in surgical as in other experience, make men judicious.

When, after the battle of Talavera de la Reyna, the order was given for all the wounded who could leave the town to march, Surgeon Rose found himself in charge of a large number of the disabled Guardsmen. Twelve or fourteen of them had compound fractures of the skull, some with depression. In none of these was the trephine employed. The retreat in the burning sun lasted sixteen days, and yet every one of those who were wounded in the head recovered.

Hennen relates the case of Corporal Corkeyne, wounded by a musket-ball in the head at Waterloo. The fractured portion of bone was driven into the brain (being exactly an inch and one-fourth from the surface of the scalp). No operation was performed, and yet the man was discharged cured in a few weeks. After quoting a similar case, Hennen sums up:—"We have here sufficient proof that there is no absolute necessity for trepanning, merely for depressed bones from gunshot—an

opinion strengthened by the cumulative experience of military surgeons, many of whom now entirely discard the trephine, while almost all are agreed that its use should be restricted to very exceptional cases.

Desault's conservatism told directly on the civil practice, not merely of his own countrymen, but of British surgeons. John Bell, with his true surgical instinct, with his impetuous energy, and with the furbished eloquence of his ripe culture, threw in his lot against the trepan. "After the expiration of my apprenticeship at these hospitals," Astley Cooper has placed on record, "I went over to Paris, to see the practice of Desault at the Hôtel de Dieu; and there I found that scarcely ever under any circumstances did he trephine; and he was more successful than the English surgeons." Abernethy and Lawrence, too, were in this matter disciples of Desault, and on the same side must be mentioned one of the most enterprising surgeons of the century—a master who combined in a very rare degree fearlessness and judgment, power of brain, and skill of hands —I allude to Robert Liston. In his *Practical Surgery* he thus writes:—"When fracture of the skull is complicated with wound of the scalp, the surgeon will not in general mend matters much by trephining, as has been advised, merely because there is a wound; if the depression is pretty extensive, and unless he has a better reason to give for the proceeding than the mere circumstance of the fracture being compound, as it is called, he will often thus add as much to the injury and to the risk which the patient is subjected to by it, as he would by dividing the scalp in simple fractures."

This warning is of special significance, emanating as it does from one who had had abundant opportunities of witnessing the effects of the trephine and elevator, and who possessed operative skill and courage in so high a degree, that he never felt the temptation to inaction as a refuge from responsibility.

Samuel Cooper was equally conservative; but it is due to you to state that three of his contemporaries—Guthrie, Brodie, and Velpeau—in the very first rank of surgical authorities, rather inclined to the heroic practice of Pott than to the physiological watchfulness and the gentle medical measures of Desault. Italian surgery has gradually come round to non-interference as the rule of practice in fractures of the skull, while the German school has traditionally been opposed to the trephine. Neudörfer, writing after the Franco-German war, sums up directly against it. Mac Cormac reflects the experience of the French and German surgeons on the battle-field of Sedan, in the statement that, "as a general rule, the largest proportion of good results (in gunshot fractures of the skull)

obtain amongst those cases where the amount of operative surgery has been at a minimum."

Jules Rochard has contributed an interesting summary of the international position of the question. Speaking of trephining, he says: "The spirit of reserve distinguishes French surgery. It holds a position between the practice of the Germans, who scarcely ever trephine, and that of the English and of the Americans, who, though resting on the same rules as ourselves, have much more frequently recourse to this operation. Léon le Fort has analysed the trephine operations on the two sides of the Channel from 1855 to 1866. He has found one hundred and fifty-seven of them in England, and only four in France, in that period."

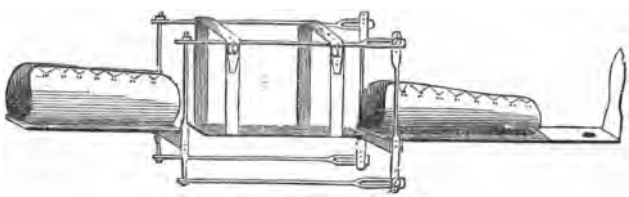
The authorities I have quoted will be sufficient to convince you that the masters of our science have treated this question as a very important and difficult one. From their differences you will learn caution and toleration in judging others, and the need of most careful inquiry, before you determine to use the trephine. The three patients whom I have brought before you with compound depressed fractures of the skull, successfully treated without the trephine or elevator, have not recovered by accident or in virtue of a curious coincidence. As many authorities are against me, I have deemed it my duty to compare my opinion with that of others, for your instruction. In examining the question from an historical point of view, I do not pretend to have exhausted it; but I do hope to have proved that the progress of opinion has, on the whole, been in favour of non-interference, when the scalp is wounded and the skull broken and driven in; without, however, producing symptoms of brain-lesion. The lesson very impressively taught by a careful study of the subject is this; that whereas the trephine was almost indiscriminately employed before surgery attained to the position of a science, its use has steadily decreased as enlightened experience has accumulated. Many surgeons, from being advocates of the trephine, have gradually abandoned it; but, so far as my researches have extended, I cannot find an instance of conversion to the practice of trephining by a surgeon whose reason indisposed him to adopt it, or whose experience had once led him to relinquish it. That there may be cases of compound depressed fracture of the skull justifying operative interference I do not deny, and I have myself had occasion to operate successfully in such cases in this theatre. Another opportunity may present itself for discussing these cases. For the present I shall limit myself to again impressing upon you my conviction that, in compound depressed fractures of the skull without brain-symptoms, the proper course of practice is NOT TO TREPHINE.—*British Med. Journal, July* 8, 1876, *p.* 37.

41.—DESCRIPTION OF A SPLINT FOR USE AFTER EXCISION OF THE KNEE.

By Victor A. Wartenberg, Esq., Junior House-Surgeon, Manchester Royal Infirmary.

I beg to submit to the notice of the profession a splint I have had constructed for application to the leg after the operation of excision of the knee-joint. It fulfils the following conditions:—1st. It allows perfect adjustment of the cut ends of the bones. 2nd. It ensures perfect immobility after adjustment. 3rd. It permits free access to the joint for the purpose of dressing the wound.

From the woodcut it will be seen that the splint consists of three parts—viz., a thigh, a leg, and a popliteal portion.



The thigh portion consists of a wooden back splint, which extends from immediately below the buttock to within three inches of the centre of the knee-joint. On its anterior surface is fixed a layer of "Hide's felt, which is so cut as to envelope the thigh. The edges of the felt are supplied in front with hooks, so that it may be laced up.

The leg portion likewise consists of a wooden back splint, which extends from three inches below the centre of the knee-joint to the foot. About three inches from the heel the foot-piece is attached to the leg-splint by a hinge, after the plan adopted by Mr. Callender. To the anterior surface of the leg-splint is attached Hide's felt in exactly the same manner as to the thigh-splint. At the distal extremity of the thigh portion, and at the proximal extremity of the leg portion, the posterior surfaces of the wooden splints are grasped by strong cross pieces of wood, which project on either side about two inches. At each extremity of these cross pieces is attached a metal upright, eight inches in height, seven inches of which project on the anterior surface of the splint and one inch on the posterior. These uprights are connected by four horizontal bars fixed by a screw and nut at the thigh end, but supplied at the leg end with a running slot and thumb-screws. This arrangement enables the two splints to be connected and adjusted at any angle, and, by simply tightening the screws, to be retained in that position.

The popliteal portion is simply a wooden back splint, four inches long, to which two straps and buckles are attached. After the dressings are applied to the wound, this splint is applied and buckled across the two top horizontal bars, and thus affords additional support to the popliteal space. This portion of the splint is removed at each dressing.

The mode in which the splint is applied is as follows:—When the operation is completed and all hemorrhage is arrested, the femoral portion of the splint, with the felt well soaked in varnish, is applied to the thigh and laced up the front. The leg portion is then put on and fixed in a similar manner, and, the surgeon fixing the cut ends of the femur and tibia in the position required, an assistant tightens up the thumb-screws, and the whole limb is thus fixed and the joint rendered perfectly immovable.

As will be seen from the woodcut, there is ample room for any form of dressing. The apparatus is adaped for united fractures and other injuries requiring complete immobility and perfect adjustment of the ends of bones.

The splint is manufactured by Messrs. Wood, of King-street, Manchester.—*Lancet, July* 8, 1876, *p.* 48.

42.—LISTER'S TREATMENT OF WOUNDS AND ABSCESSES BY THE ANTISEPTIC METHOD.

By THOMAS SMITH, Esq., Surgeon to St. Bartholomew's Hospital.

[The following explains the mode in which Mr. Lister reduces his theory to practice, and the advantages he claims for the antiseptic method in the treatment of abscesses.]

Having opened the abscess, he provides a free escape for the pent-up matter by the use of drainage tubes, and thus he gets rid of the tension which he believes was the cause of the continuance of the suppuration before evacuation. By excluding putrefaction, and thus avoiding a new cause of irritation, which would otherwise come into operation, he leaves the pyogenic membrane free from all abnormal stimulus. As a result of this, he states that suppuration ceases from the moment the original contents of the abscess have been let out, a mere serous oozing being all that subsequently occurs, and that this diminishes more or less rapidly according to the circumstances of the case, lasting longest, as a rule, when carious disease of bone is present. Mr. Lister states that the spontaneous cure of caries under antiseptic treatment is a striking feature of the system, but in order that it may occur he considers it to be essential that the diseased part should be kept absolutely at rest—a condition that is difficult to secure in the treatment of some joints, but can readily

be complied with in the case of spinal caries. Lumbar and psoas abscesses, which, as you know, generally do badly after evacuation, are, according to Mr. Lister, most hopeful subjects of treatment, provided that unremitting care be exercised to maintain the antiseptic precautions till the sinuses are completely cicatrised.

In carrying out his antiseptic method in the treatment of wounds and abscesses, Mr. Lister's chief aims are: first, to exclude all germs of putrefaction; and, secondly, to provide a free escape for all secretions. Now the first object is attained by cleansing from putrefactive germs the part to be operated on, the instruments and sponges employed, and the hands of those that use the instruments; by creating a germless atmosphere during the necessary exposure of the part; and by disinfecting all discharges coming from the part, lest putrefaction should occur in these, and from these spread to the wound itself.

Mr. Lister has selected carbolic acid as, on the whole, the most convenient antiseptic for his purpose, and this he uses either in the form of *spray*, to protect the part from atmospheric influences during its unavoidable exposure; as a *watery solution*, for washing the surface to be operated upon, for injecting into a wound-cavity to destroy any sources of putrefaction that may have gained entrance, for purifying instruments, sponges, &c.; and in what is termed *antiseptic gauze*—i. e., thin gauze impregnated with a mixture of carbolic acid and resin,—this being employed over the wound or abscess to soak up and disinfect the discharge. In addition to these preparations, thin india-rubber sheeting and oiled-silk protective are made use of in the dressing of wounds. The former, which is merely a thin layer of india-rubber spread upon calico, is used beneath the outermost layer of the gauze to prevent the discharge coming into contact with the atmosphere, and to make it soak well into the gauze. The oiled-silk protective is used beneath the dressings to protect the cicatrising surface from the action of the carbolic acid; it is formed of oiled-silk coated with copal varnish and brushed over with a thin layer of dextrine.

A very important part of Mr. Lister's treatment is the provision he makes to secure a free escape from the wound or abscess cavity of all secretions. This he effects by the introduction of india-rubber drainage-tubes of sufficient calibre, and provided with a sufficient number of lateral perforations to secure a ready escape of all fluids. Mr. Lister has pointed out that under his system it is especially necessary to make this provision, for, when applied to fresh-cut surfaces, the carbolic acid, by its stimulating properties, excites an abundant secre-

tion, which if retained within the wound-cavity would be a serious source of danger; while in the treatment of abscesses the use of the drainage-tubes is insisted on, to avoid tension of the abscess walls by accumulation of pus—tension being, according to Mr. Lister's view, a most potent source of continued suppuration and constitutional irritation.

Perhaps the best way to explain the method of applying the antiseptic treatment to an abscess is to exhibit an actual demonstration of the practice. The large abscess that you see here in the gluteal region is one that has formed in the progress of hip-joint disease, and is without doubt connected with the articular cavity; it is, therefore, suited for our purpose to test the powers of the antiseptic method, especially as the boy has an open abscess in the opposite knee-joint. In this shallow dish, containing a watery solution of carbolic acid (one part to forty) are the instruments required—a knife, director, artery forceps, a large piece of india-rubber drainage-tube attached to a small piece of ligature silk, and a small piece of oiled-silk protective (two or three inches square). Here is the steam spray apparatus made by Mayer and Meltzer, which throws a large cloud of very fine carbolised spray, of the same strength as the lotion (one in forty). The skin over the surface of the abscess is first sponged with the watery solution of carbolic acid; and Mr. Vernon having cleansed his fingers with the same solution, the steam spray is turned on, and will be allowed to play on the part during the whole process. The abscess is now opened, and the pus is squeezed out as thoroughly as possible; the drainage-tube is passed deeply into the abscess cavity, and its open end is adjusted so as just to come to the level of the skin. The blood and pus are wiped away with a piece of the gauze soaked in the watery carbolic solution; the small piece of oiled-silk protective is put over the wound, a little hole being cut in its centre so as not to obstruct the open end of the drainage-tube; the ligature-silk attached to the tube is drawn through the hole and laid on the surface, and the whole is covered with the gauze dressing. As the discharge is likely at first to be rather free, from so large an abscess cavity, you will observe that Mr. Vernon places about the wound and around the mouth of the tube a few scraps of loose gauze, to soak up the discharge and prevent it running under the larger sheet of the same material. The larger piece of gauze dressing is about twelve inches square; it is made of sixteen thicknesses folded together, and between the two external layers is inserted a piece of the india-rubber sheeting with the glazed surface downwards; this sheeting should be smaller than the gauze, so as to be well overlapped by it. The whole is secured with a bandage made of carbolised gauze.

In the subsequent management of this case it will be necessary, whenever we may think the gauze is nearly soaked with discharge, and before the discharge has made its way through so as to come into contact with the external air, to change the dressing. Until we are aware of the amount of discharge this abscess will furnish, it is well to remove the dressing at comparatively short intervals. Mr. Vernon will examine it to-morrow, and, if the amount of discharge is not excessive, will replace the same dressing, or he may remove the small pieces of gauze from around the tube and replace these by others, retaining the large sheet of folded gauze.

The dressings are always carried on under the antiseptic spray with the same precautions that you have witnessed; the drainage-tube is gradually shortened as it is pushed out by the formation of granulations in the abscess cavity, and at each dressing the tube is thoroughly washed in the watery carbolic solution. In changing the dressing, the gauze, when soaked, must be laid aside; but the india-rubber sheeting may be used again and again, provided it is well cleaned by sponging with carbolic solution.

You will have observed that the details and precautions of this plan are somewhat numerous and minute, and you may think them frivolous; but you will allow me to remind you that, granting the germ theory of putrefaction to be true, they are neither unmeaning nor excessive if it be the design of the treatment to prevent putrefaction.

It is of course absolutely necessary that the dressing should be so efficiently secured that it cannot shift its place, and when the opening is situated at the groin, as in psoas abscess, this is far from easy by the ordinary means. I learn, however, from Mr. Lister that he has lately overcome this difficulty by the simple expedient of putting on outside the dressing a bandage of elastic webbing carried once or twice round the pelvis and thigh, so arranged as to press on the edges of the dressing at the most important parts. Experience has shown that this bandage effects its object without causing either œdema of the limb or discomfort to the patient, while it enables the surgeon to leave his patient safely for a week or more at a time without disturbing the dressing when the discharge comes to be of small account.

In cases where the treatment succeeds in its object the discharge gradually decreases in quantity, and the intervals between the dressings become longer as the case proceeds towards cure. —*Lancet, July* 1, 1876, *p.* 4.

43.—ON BORACIC ACID AS AN ORDINARY DRESSING FOR WOUNDS.

By Dr. LEONARD CANE, Consulting Surgeon to the Peterborough General Infirmary.

[It is as a simple dressing for wounds of all kinds, altogether apart from the antiseptic system strictly so called, that Dr. Cane wishes to draw attention to boracic acid.]

We want something which, while it has to a certain extent the merits, yet is without tedious details, and which can readily be performed by anyone without assistance.

The preparations of boracic acid have now been rather extensively tried by me for some months, and in all the cases in which they have been used the results have been good, and decidedly better than under the ordinary methods of dressing. The most convenient forms for use are the boracic (boric) lint and cotton wool, a concentrated watery solution of the acid, and boracic ointment. Boracic lint is prepared by soaking lint in a saturated *boiling* solution of the acid. On drying the lint a copious deposit of fine flaky crystals takes place between its fibres. Cotton wool may be similarly served, and when dried and carefully picked out forms a very useful dressing. The concentrated solution is made by dissolving the acid in boiling water to saturation. The ointment is made by rubbing down one drachm of the acid with one ounce of simple ointment, or benzoated lard.

Boracic acid, unlike most antiseptic agents, is bland and unirritating; and, whilst its non-volatility renders it less useful in some cases than carbolic acid, its great superiority to this and to chloride of zinc resides in its unirritating nature. The boracic lint is best used as a dry dressing, and for recent wounds where simplicity is desired it has no equal. A pad of lint applied immediately over the wound, and kept in place by pieces of strapping, is all that is required, and union by first intention is a common result.

The following cases will illustrate its application to this kind of wound.

An elderly gentleman was drawing the cork of a wine bottle and applying considerable force when the shoulder of the bottle broke in his hand, and he received a jagged wound obliquely across the palm of the left hand, extending from the ulnar side of the wrist to the cleft between the thumb and forefinger. Considerable bleeding took place and several small arteries were wounded, but the hemorrhage was temporarily stopped by tightly binding up the hand and wrist. The wound was gently bathed with some boracic lotion and brought together by three silver-wire sutures. A long pad of boracic lint, about four

folds thick, was then placed over the wound and firmly strapped down by plaster. The whole hand was then firmly bandaged. On the third day the pad was removed. There had been some bleeding; there was very little swelling of the hand, and no offensive smell to be detected. On taking off the pad the wound was seen to have united at its extremities, where it was more cleanly cut, and at the deepest and most irregular part it was looking healthy. There was a little suppuration, but no odour of putrefaction. The stitches were taken out and the hand dressed as before. On the sixth day the dressings were again undone, and the wound was then found to have entirely healed except about half an inch of its length, which had become superficial and was covered with a whitish glairy discharge; there was no fetor or evident suppuration. The dressings were reapplied, and on the ninth day were removed altogether, the wound having completely healed, leaving a firm cicatrix. This case illustrates the simplicity of the method, for with a severe wound four inches long, nothing further was required than three simple dressings.

J. B., aged twenty, labourer, was knocked down by the wheel of a thrashing machine and received a wound on the outer side of the left knee, part of the wheel passing over the side of the knee. On examination I found a contused wound, the surface of which was almost reduced to a pulp, and measuring about two inches across in any direction, whilst in the centre it was half an inch deep. There was some swelling of the knee-joint, which had come on very rapidly, but beyond this no injury to the joint itself could be detected. The trousers over the knee had been torn, and the wound was very dirty. It was not bleeding to any extent. I first washed out the wound with some boracic lotion, pouring it from a height in a gentle stream, so as to remove the particles of dirt, &c., then applied a pad of boracic lint several folds thick, and placing a splint behind the knee to keep it at rest, firmly fixed the whole with a bandage. On the following day the dressings were removed. There had been a great amount of discharge, and the dressings were soaked with it. The discharge consisted of pus and debris from the wound, and was decidedly putrefactive. There was considerable inflammation round the wound, and the knee was swollen and so painful that the patient could not sleep. The wound was well washed out with boracic lotion, and the pad applied as before. Dressings taken off next day; swelling, pain, and redness less marked; discharge still profuse, but no longer fetid. Dressed as before. For the next three days the wound was dressed daily and made steady progress; after this at intervals of three days for a fortnight, during which it granulated and cicatrised, forming a good cicatrix. For the latter part of the

time the patient dressed the wound himself, simply applying a piece of boracic lint.

In cases of phlegmonous erysipelas, where sloughing takes place, the boracic lotion appears to have a very beneficial effect, and to stop further spread of the mischief. The following case illustrates its use.

A. M., aged fifty-six, female, who had suffered from ulcers on the leg some years previously, was taken suddenly ill with rigors, vomiting, and fever, without any apparent cause beyond "catching cold." She lived in the country; had not been where there was any illness, and had not received any wound or injury. She took to her bed at once, and complained of severe pain on the outer side of the left instep and up the calf of the leg. In the course of a few hours the leg swelled to a great extent, and was intensely painful. Patient became delirious, and her temperature and pulse ran up quickly. The leg soon became brilliantly red and extremely painful and tender. On the third day the swelling about the foot felt "boggy," but there was no fluctuation to indicate any circumscribed collection of matter. Large blebs formed on the surface of the instep and ankle. The next day a patch, five inches long by two and a half inches broad, appeared on the outer side of the foot, paler than the surrounding skin, of a yellowish marbled colour, and evidently about to slough. No deep fluctuation could be found anywhere, and it was not thought advisable to make any incisions. The skin over the patch gave way on the following day, and the sloughing process appeared to be rapidly extending. The whole leg was very much inflamed and swollen, and red lines, following the course of the lymphatics, were seen on the thigh. Up to the present time the chief treatment had been fomentations to the leg, while nourishment in every available shape was given to the woman. The erysipelatous state appearing to spread, and a large slough having made its appearance on the inner side of the foot just below the ankle, the whole leg and foot were ordered to be bathed at frequent intervals with a warm solution of boracic acid, and the foot to be kept constantly wrapped in linen cloths wetted with the same. Liberal support, with quinine and perchloride of iron, to be continued as before. The next day there was some improvement: the inflamed lymphatics upon the thigh were less tender; the redness of the foot and leg had somewhat diminished; the sloughing had not extended. Dressed as before. In the course of the next two days the swelling of the leg and foot decreased; the large slough on the outer side of the foot became surrounded by a line of demarcation and began to separate. No extension of the disease had taken place, and the patient had decidedly improved in her general symptoms. The sloughs separated in the

course of a week, leaving a large surface about one-third of an inch deep, which suppurated freely, but was without any odour of putrefaction. Patient expressed herself as greatly relieved by the lotion, and said that during the night, if not dressed for a few hours, it became much more painful. From this time the large wounds gradually and without any interruption, healed. The granulations were healthy and the discharge comparatively slight. The whole of both wounds cicatrised well, and patient entirely recovered the use of her limb, though with some stiffness.

In this case the effect of the antiseptic on the spread of the erysipelatous inflammation was very evident, and the whole progress of the case fully bore out the advantages which were expected from the boracic acid.

As a simple dressing for old ulcers of the leg the boracic lotion and lint are cleanly, and the healing processes go on favourably under its use, sometimes succeeding when other applications have failed.

J. G., aged thirty-six, had large deep ulcers which followed her confinement two years ago. They were situated on the inner side of the ankle and below the knee. She was ordered to rest her leg up, and was given liberal diet; whilst the wounds were dressed with sulphate-of-zinc lotion ("red wash") for some weeks. Under this treatment they improved slowly, but not very satisfactorily. The dressings became fetid occasionally from neglect, and for some weeks the ulcers got better and worse alternately. The ulcers were accordingly well washed with boracic lotion every morning, and afterwards covered with boracic lint. Under this treatment a marked change occurred; the ulcers became clean, lost all their fetor, and were completely healed in three weeks' time.

In skin-grafting the boracic acid is very useful. I have found the following plan answer best:—The surface to which it is intended to apply the grafts is first well cleaned by applying the boracic lotion for some days, till the discharge is perfectly free from putrefactive odour. The skin from which it is intended to take the grafts is also well washed with the lotion. Small portions of the skin are then removed, and applied to the raw surface in the usual way. I then protect the grafts by a strip of gutta-percha tissue dipped in the boracic lotion, and over all apply a piece of boracic lint. Under this plan the grafting is very successful, and gives very little trouble. The following case will illustrate the method:—

A. P., aged thirty-six, domestic servant, applied on account of a large varicose ulcer on the leg. The ulcer was of old standing, and had broken out and healed over several times before. When first seen it measured about two inches in all

directions. It had raised and indurated edges. The floor of the ulcer was dark purple, and the granulations were unhealthy. The skin round the ulcer was dark and congested. Patient had worn a bandage for some time, and could apply it evenly. The ulcer was first well washed with boracic lotion, covered with boracic lint, and then the leg was well strapped from the ankle to above the ulcer. Patient was given some boracic lotion, with orders to remove the strapping after three days, and then apply linen rags twice a day wet with the lotion. At the expiration of a fortnight she came again. The wound was much healthier in appearance. The edges were reduced and less prominent. The granulations were redder, and the discharge less, and quite inodorous. Five grafts were now applied to the ulcer, the skin being taken from the woman's arm, and the whole dressed as described above. When next seen (ten days afterwards) the wound had lessened in size to the diameter of an inch. Three of the grafts had grown considerably, and one had joined the edge of the ulcer. The wound looked healthy, though patient had been obliged to walk about considerably. There was now very little pain. She continued to apply the lotion once a day, and the wound completely healed in a short time.

This case shows how little trouble the dressing gives. After the grafts were applied the patient had to walk away from my residence. She was unable to rest up, and could only apply the lotion once a day. Yet with this little attention it made steady progress, and patient was more free from pain than she had been for months.

For boils on the neck and elsewhere the boracic lint is an excellent application; a piece large enough to hide the boil, and covered with a piece of gutta-percha tissue, often gives great relief. For carbuncles and other cases in which it is desired to apply a poultice, I have found the new "instantaneous poultice," prepared from Iceland moss by Messrs. Rigollot, a capital and efficent remedy. The poultice should be prepared by soaking it for a short time in the boracic lotion, and when applied should be covered with gutta-percha tissue.

Lastly, in some of the vegetable parasitic diseases, such as pityriasis versicolor, tinea circinata, &c., the boracic lotion and ointment will often be found serviceable.

Briefly to sum up the advantages of boracic acid:—

1. It is an *antiseptic which does not irritate and inflame*, and so allows the natural processes of healing to go on without much interruption.

2. It is exceedingly *simple* in its application, and can be used apart from all the details required by a thoroughly antiseptic method.

3. It can be used in the shape of the lint, lotion, cotton-wool, &c., in combination with most other methods of treatment.

4. Its *cost is trifling;* and though this is of secondary importance, it is a feature of the treatment which will recommend its employment in workhouse infirmaries and in dispensary and parish practice.—*Lancet, May* 20, 1876, *p.* 734.

44.—SULPHUROUS ACID WASH AS AN ANTISEPTIC FOR COUNTRY PRACTICE.

By JOHN BALFOUR, Esq., Leven.

The splendid results obtained through the practice of antiseptic surgery cannot but have excited in every one, liable to be called on to perform an operation, the desire to avail himself of the improvement. In large hospitals and cities, where doctors thick do congregate, to do is almost as easy as to will—but it is otherwise with the country practitioner, who may have at any moment to operate in slight cases without any assistance, and to perform a capital operation with such aid as may on the spur of the moment be available. I have twice before, in the pages of this Journal, recommended for such cases the use of the sulphurous acid wash, originally recommended by Dr. Dewar of Kirkcaldy, and I again bring it forward as a valuable antiseptic, which I have now used for many years with great satisfaction in all cases of factory accidents, cuts, and lately in a case of amputation at the shoulder-joint. In the proportion of one in twelve of water, I find that it at once alleviates pain, minimizes suppuration, is easily applied, and facilitates dressing the wound, while it costs almost nothing. When the fingers are the parts injured, I have a large teacup filled with the wash put by the patient's side, and into this the injured part, covered with the thinnest rag to be had, is dipped as often as desired. Should the injured part be the hand or any other part of the body, it is supported on a pillow covered with gutta-percha tissue or oilskin, and the wash is applied by means of a little tow, which is allowed to remain in the cup. I give a short abstract of three cases of different kinds of injury, as specimens of what can be done by such simple means.

T. G., a collier, about 25 years of age, came to me on the evening of the 6th May, 1872. He had been crow-shooting, and a companion's gun burst; a piece of the barrel of the gun passed close in front of his body, entered the left arm about the middle of the inner surface, and lodged between the skin and the biceps, projecting partly on the outer side of the arm. A companion had extracted the piece of iron by the wound of entrance. This was between three and four inches long, very

irregular, and the skin much curled up. The other wound was about half the length of the first, and not so irregular. I arranged the skin as well as I could, and applied the wash, and my patient, who had been in great pain, was relieved before he left the house—and this relief was so complete, that he enjoyed a good sleep the first night. Although part of the skin sloughed from the severity of the injury, the suppuration was so moderate, that my patient, accustomed to see serious injuries, remarked, "Why, it has na *bealed* (suppurated) at all." The wound was quite healed by the 1st June.

E. G., a factory girl, on the 14th February, 1876, allowed her fingers to be caught between a wheel and pinion, and the little, ring, and middle fingers were carried through. I was sent for to the factory, and took a supply of the wash with me. I found that along the dorsal and palmar aspect of each of the fingers was a deep contused wound, extending almost exactly the length of the middle phalanx. This bone in the little finger was split longitudinally, and the distal joint was partly dislocated; the phalanges of the other fingers, though undoubtedly much bruised, had escaped fracture. After adjusting the bones, I dressed the wounds with the lotion. Sleep was enjoyed the first night. There were no bad symptoms, and by the 6th March my patient had returned to her work with the bone united, the wounds healed, and only the distal joint of the little finger stiff.

A. S., employed as a hemp-breaker in one of our manufactories, on the 19th January had his right hand caught between the hemp and a shaft revolving about the rate of seventy times a minute. He lost his presence of mind, and did not throw the machine out of gear, as he might have done, and, before a neighbour could do it for him, he had been spun over more than once. The forearm was torn off near the elbow, and the humerus fractured in three places, the highest being about the insertion of the deltoid. I was fortunately at home and saw him immediately, when it was apparent that amputation at the shoulder-joint was imperative. I was equally fortunate in getting for assistance, Dr, Lyall of Leven, a young medical friend of his, and a civilian whose experience as a surgical assistant renders his aid invaluable. The shock was not great, and as soon as the necessary things were got ready the operation was performed under chloroform; the arteries were tied with carbolized catgut; the wound was freely sponged with the sulphurous-acid wash, brought together with wire sutures, and a strip of lint well wet with the wash put over it; a full supply of wash was provided, and the patient's wife and mother were instructed to keep constantly applying it. Chloral hydrate was required every night for about a week, and a cough mixture

for a sharp attack of bronchitis, from which he was suffering when he met with the accident. The deep wound healed well and soundly; in eight days I had all the stitches removed, and my man was safe. He had not a very good constitution, however; the wet was beginning to irritate the skin of the back, and I substituted a simple dressing of zinc ointment for the back; the axillary glands gave me trouble, suppurating in an unhealthy manner, and a small bit of lint worked itself out of the upper part of the wound (how it got in I cannot conceive). These were untoward events, and greatly protracted the cure; still the battle was won in the first few days; there was almost no suppuration whatever of the deep wound, and the result is as perfect a cicatrix as one would wish to see. I paid my last visit on the 24th of March, and my patient has, since shortly after that time, been earning a decent living with his left hand.—*Edinburgh Medical Journal, August* 1876, *p.* 103.

45.—A NEW OPERATION FOR THE OBLITERATION OF DEPRESSED CICATRICES AFTER GLANDULAR ABSCESSES, OR EXFOLIATION OF BONE.

By Wm. Adams, Esq., Surgeon to the Great Northern Hospital, and to the National Hospital for the Paralysed and Epileptic.

Amongst the operations which surgeons are not unfrequently called upon to perform, for the purpose of diminishing some of the effects of accident or disease—especially when producing any unsightly appearance—may be mentioned the operations for the removal or obliteration of deeply depressed cicatrices, such as result either from chronic glandular abscesses in the neck, or from disease of bone in any region. Various operations have been performed for his purpose; but the one which I now propose to bring before the notice of this Association has not, so far as I am aware, hitherto been suggested or performed.

The operation consists—1. In subcutaneously dividing all the deep adhesions of the cicatrix by a tenotomy knife, introduced a little beyond the margin of the cicatrix, and carried down to its base; 2. In carefully and thoroughly everting the depressed cicatrix—turning it, as it were, inside out, so that the cicatricial tissue remains prominently raised; 3. In passing two hare-lip pins, or finer needles, through the base, at right angles to each other, so as to maintain the cicatrix in its everted and raised form for three days. 4. In removing the needles on the third day, and allowing the cicatricial tissue—now somewhat swollen, succulent, and infiltrated—gradually to fall down to the proper level of the surrounding skin.

Case 1.—*Deeply Depressed Cicatrix on Cheek after Injury to Malar Bone by a Pistol-shot.*—The first case in which I performed this operation occurred in a young officer in the army, Lieut. B., aged 30, who, during the Indian mutiny, had received a pistol-shot in the cheek. A portion of the lower edge of the malar bone had been carried away by the ball, and a deeply depressed cicatrix remained adherent to the bone. When the muscles of the face were thrown into action, more especially in a smile or laugh, all the features seemed to be drawn towards the depressed cicatrix, which at once became painfully conspicuous.

This gentleman was very anxious to submit to any operation for the removal of the cicatrix, or calculated to diminish its unsightly appearance; but I was at a loss to know what to suggest. I had on other occasions tried Dieffenbach's plan of subcutaneously dividing the deep adhesions of a cicatrix, and then moving it laterally to a new position, so as to alter its relations, and elongate or destroy its adhesions; but I had not found this plan very successful. I had also dissected out cicatrices and drawn the edges together, after cutting through fat and cellular tissue under the skin, on a plane parallel with its outer surface, so as to evert the edges of the skin; but this operation had failed to remove any deep depression. Many unsightly scars may be removed by this method, leaving only a linear cicatrix scarcely perceptible; but should any deep depression have existed before the operation, it will, to a greater or less extent, gradually return in a few months: the hole does not become filled up, so that this operation did not appear to be applicable to the present case.

Upon reflection, it occurred to me that if, after subcutaneously separating all the deep adhesions of the cicatrix, I could succeed in everting the cicatricial tissue, and retain it in the everted condition for a few days, the depression would become filled up by inflammatory infiltration, so that the cicatricial tissue could not again fall down below the level of the surrounding skin, thus the depression would become obliterated, and all the adhesions of the cicatrix to the bone, fascia, and muscles, such as produced the conspicuous deformity in this case, would be effectually removed. The only doubt I had in my own mind was, whether in the course of time, absorption and recontraction of the inflammatory lymph would take place, so that the depression would return to a greater or less extent. The case was, however, one of urgency and importance; I, therefore, determined to try the plan of everting the cicatrix, as above described, an operation which I performed on March 2nd, 1864. As the adhesions to the bone and the adjacent fibrous tissues were close and widespread, their separation was somewhat tedi-

ous and difficult; but I succeeded in thoroughly everting all the cicatricial tissue, and passed two needles through its base, to retain it in its everted condition. On the third day I removed the pins, when the cicatricial tissue was in a thickened and succulent condition. It showed no disposition to fall into a depression again, and, indeed, remained somewhat too prominent; but in the course of a few weeks the cicatricial tissue fell to the level of the surrounding skin, and the improvement produced by the operation was extremely satisfactory; although a portion of the malar bone having been destroyed, it could not be said that the depression was entirely obliterated. The deep adhesions of the cicatrix having been so thoroughly separated, there was no appearance of a deep hole towards which the features were drawn when the muscles of the face were thrown into action in talking or smiling.

Case 2.—*Deeply Depressed Cicatrix on Right Side of Neck, resulting from Chronic Glandular Abscess.* — The second case which came under my observation was that of a young lady, Miss B., who was sent to me by my friend Dr. Sharpe, of Norwood. On the right side of the neck, a little below and behind the angle of the jaw, was a large and deeply depressed cicatrix, which had resulted from chronic glandular abscess. The base of the cicatrix was adherent to the fascia, over the sterno-mastoid muscle, and its depressed apex slipped down a little in front of the anterior border of this muscle. At this part, a branch of the jugular vein was in close proximity to the cicatrix. The operation was performed on April 27th, 1866, in the same manner as described in the previous case; the only difficulty arose from the close proximity of the large vein, which was so intimately involved in the adhesions that the greatest care had to be taken to avoid opening it. No such accident, however, occurred, and the operation was in every way most satisfactory. The needles were removed on the third day, and the cicatricial tissue remained raised above the level of the surrounding skin for a considerable time. For several months afterwards it remained a little thickened and prominent. Absorption, however, gradually proceeded, and the level of the surface was restored, without the least inclination to any depression recurring.

I have frequently seen this young lady since, up to the present date, more than nine years since the operation, and not only has the depressed cicatrix been entirely obliterated, but, from the improvement in the cicatricial tissue, slight traces of it only remain.

Case 3.—*Deeply Depressed Cicatrix on Right Side of Neck, consequent upon Abscess with Necrosis of the Lower Jaw.*—Miss S., aged 26, was sent to me also by Dr. Sharpe, of Norwood, in October, 1872. Her general appearance was healthy. On the

right side of the neck, a little below and behind the angle of the jaw, was a deeply depressed cicatrix large enough at its orifice to admit the end of the little finger, and its apex reaching to the surface of the jaw-bone. The deep surface of the cicatrix was adherent to the fascia, over the sterno-mastoid muscle, dragging from its anterior border. The free anterior border was formed by a prominent semilunar fold of the skin, three-fourths of an inch in length, and rendered still more prominent in some movements of the head, in consequence of the firm adhesions of the deep surface of the cicatrix. On the opposite side of the neck, a little below and behind the angle of the jaw, was also a large cicatrix, with its deep surface adherent to the fascia, over the sterno-mastoid muscle, and having at its anterior free border a semilunar fold of skin, but without any deep depression. Its general appearance was that of a large, flat, and adherent cicatrix. There were also two small cicatrices, one on each side of the chin, depressed and adherent to the bone.

Of these cicatrices she gave the following history. Six years ago, being then twenty years of age, at the time when the last molar, or wisdom-teeth, were making their appearance, considerable swelling and inflammation occurred about the angle of the jaw, on the left side. The dentist could not force the mouth open, and she was unable to take solid food for a month, At the end of this time, the dentist, with difficulty, extracted the last molar tooth on the left side in the lower jaw; and it is said that some bony enlargement of the fang of the tooth existed. Abscesses about the angle of the jaw and necrosis of the bone followed: several pieces were removed by Dr. Sharpe, and the patient took away small pieces herself. The late Mr. Partridge removed a large piece of bone. A few months later, severe inflammation, with swelling of a similar character, occurred about the angle of the jaw on the right side, and the last molar tooth was extracted with difficulty about six months after the removal of the tooth from the left side. Necrosis of bone also occurred on the right side, and a number of small pieces continued to come away from time to time nearly up to the date of the operation. Altogether, less bone, she states, came away from the right side than from the left. Small pieces of bone also came away through two sinuses under the chin, indicated by the small cicatrices alluded to. All the molar, and some other teeth on both sides of the lower jaw, had to be removed; and only six of her own teeth now remain in the lower jaw—viz., the four front teeth, and two bicuspids on the left side.

This patient was most anxious to submit to any operation for the obliteration of the large depressed cicatrix on the right side,

which, from its unsightly appearance, and the popular prejudice against a supposed scrofulous constitution, had prevented her from obtaining a situation as lady's maid. I therefore performed the same operation as that described in the previous cases, at the Great Northern Hospital. It was necessary to take great care to avoid opening one or two large veins leading to the jugular; and the separation of the cicatricial adhesions to the jaw-bone, and also the adhesions to the fascia over the sterno-mastoid muscle, was both tedious and difficult, a little venous hemorrhage occurring. The cicatricial tissue, however, was thoroughly everted, and the needles introduced. These were removed on the third day, when it was evident that a little suppuration had occurred. A poultice was therefore applied for a week, and then wet lint at night, and a piece of soap-plaster during the day. The cicatricial tissue remained in a somewhat infiltrated and thickened condition, above the level of the surrounding skin, for three or four months; but at the end of six months it had fallen to the level of the surrounding skin, and, being of a pale colour, no longer attracted attention. At this time, she obtained a situation as lady's maid without difficulty. At the present time (August, 1875), nearly three years since the operation, no trace whatever of the depression remains; the cicatricial tissue alone can be seen; but it is perfectly on a level with the surrounding skin, and has so much improved in texture and appearance, as very nearly to resemble it.

After the operation, the cicatricial tissue always loses its shiny, membranous, and vascular character, like that on the left side of Miss S., which has not been operated upon: it becomes thickened, and of an opaque white colour. The thickening of the cicatricial tissue results from its succulent condition during the three days it remains elevated by the pins, and the inflammatory infiltration at its base.

The permanency of the operation is placed beyond all doubt by the two last cases described—one nine and the other nearly three years since the operation; and the completeness of the obliteration of the depression and the improvement of the cicatricial tissue, has surpassed my most sanguine expectations—*British Medical Journal*, April 29, 1876, p. 534.

46.—A NEW METHOD OF WOUND-DRAINAGE.

By JOHN CHIENE, Esq., F.R.S.E., Assistant-Surgeon to the Edinburgh Royal Infirmary.

Acknowledging the undoubted advantages of the drainage-tube as regards efficiency, I have long felt its disadvantages; for instance, its interference with rapid healing throughout the

whole extent of the wound; the irritation it not unfrequently caused by its presence as a foreign body; the blackening of the protective, showing that irritating compounds were always present in the rubber, however pure; the tendency to regurgitation of air along the elastic tube during the dressing, thereby increasing the danger of mischief passing into the depths of the wound; the necessity of dressing a case solely in order to shorten the tube; and the impossibility of being able properly to estimate the rate at which this should be done. These are self-evident evils, and their removal has for some time occupied my attention.

During last Christmas holidays, Mr. Callender, of St. Bartholomew's Hospital, London, when on a visit to this city, informed me that he had stitched together the ends of the drainage-tubes with a catgut stitch, in order to keep them in position for the first three or four days, when the catgut became absorbed, and then the tubing could be gradually removed. The idea then struck me—Why not make the entire drain of catgut instead of gutta-percha? If efficient, its advantages in being absorbable were apparent. This might be done in two ways: either by bringing the catgut ligatures out at the corners of the wound instead of cutting them short; or by passing a skein of catgut through the cavity of the wound before stitching it up. I have made trial of the latter plan.

The first case on which I tried it was Mrs. M., on whom it was necessary to amputate by Carden's method at the knee-joint in consequence of a recurrent sarcoma of the tibia. The operation was performed on the 20th of April, 1876. In this case I carried a skein of thick catgut of eighteen threads through the stump, bringing the ends out at the corners of the wound. I passed two rings of drainage-tubing, each half an inch in length, on to the skein, and placed them in position at the outlets of the catgut drain. My object in doing this was that I did not like, on the first trial, to depend entirely on the skein. This drain acted perfectly. The rings were removed on the third day. On the seventh day, after the greater part of the wound was consolidated, and after the incision had healed by the first intention, except at the corners where the ends of the drain issued, I failed in the antiseptic management of the case, and putrefaction occurred, spreading rapidly along the catgut drain, which soon rotted, and was removed on the tenth day. During the time the drain was in position no tension whatever occurred. This case convinced me that further trial was justifiable, and that capillarity was sufficient to carry off the discharges.

The next case was one of amputation at the ankle-joint. J. B., admitted on the 25th of May, a railway truck having run

over his right foot, crushing it, and necessitating amputation. In this case I made a counter opening in the posterior and inferior surface of the flap, and, tying at its centre a skein of the finest gut of twenty-four threads with a thread of catgut, I divided it into three equal parts and brought one-third out at each corner of the wound, and the remaining third out at the artificial opening. I then placed in position at the inferior outlet a ring of tubing, omitting it at the other two. The object of this triple arrangement was to test the necessity for tubing at the outlets. I found by the staining on the gauze that free drainage was established at all three openings, showing that the tubing was unnecessary, and that in future entire dependence might be placed on the skein. The tubing was removed on the third day. The ends of the skein became loose between the sixth and tenth days. I am not able to fix the exact date, as the deep dressing was not changed between the sixth and tenth days; on the sixth day the ends of the drain were firmly attached; on the tenth day they were lying loose on the dressing. The stump on the tenth day was firmly consolidated, union by first intention occurring throughout the whole extent of the wound.

The next case on which it was used was an excision of the knee. P. F., operated on on the 31st of May for osseous angular anchylosis, the result of a wound of the knee-joint a year previously. In this case a skein of thirty-two threads of medium gut was passed behind the bones, and a skein of sixteen threads in front of the bones, and the ends of both skeins brought out at the corners of the wound. The anterior skein was stitched with a thread of chromic-acid gut to the tissues over the femur in order to prevent its displacement. The ends of the drains fell off on the twelfth day. The incision healed by the first intention, except at the corners, from which a slight serous discharge of a yellowish colour continued until the twenty-fifth day at the outer corner, until the thirtieth day at the inner corner. Small portions of the gut came away during the period between the twelfth and thirtieth day, and I am of opinion that, in this case, too thick a drain was used, and that, although absorption removed the greater part of the drain, the quantity of gut was in such excess that some came away on the discharge, and prevented the healing of the corners of the wound at a much earlier period. The wound is now firmly healed.

Another case on which I tried the method was one in which it was necessary to remove a small fatty tumour from the subcutaneous tissue of the upper part of the forearm. In this wound, a small one, I laid two threads of catgut along the wound, bringing them out at the corners before stitching up. In the same patient it was necessary also to remove a painful

neuroma over the lower end of the ulna. The depth of the wound was considerable, as compared with its superficial extent; in it I stitched with chromic-acid gut the drain to the bottom of the wound, bringing the ends out at one corner of the wound.

The dressing was reapplied on the second day, and again on the fourth day, when the stitches were removed. The patient was sent home on that day with the drains still in position, and acting efficiently. She returned on the fourteenth day after the operation, when, on removing the dressing, the wounds were healed, the drains having dropped off in the interval. This case illustrates two things: first, the necessity of stitching the drain to the bottom of a deep wound in order to retain it in position; second, that the use of this method materially lessened the number of dressings, and necessarily the expense; and, further, that the stay of the patient in hospital until the wound was healed was not necessary.

These cases are sufficient to illustrate the advantages of this method of drainage by catgut. It is still on its trial, and my thanks are especially due to Mr. Lister, who has kindly put it to further and more extensive test.

The number of threads necessary in each skein will depend on the size and importance of the wound. As I have already said, too large a quantity was used in the case of excision of the knee. In a large wound, as far as I am at present able to judge, eight to sixteen threads should be sufficient in each skein; the number of the skeins depending on the shape and size of the wound. In cases in which very profuse discharge is expected, either in a specially large wound or after a tedious operation, in which the wounded surface is necessarily exposed for a considerable time to the irritation of the carbolic spray, it will be better to increase the number of separate skeins, stitching them to different parts of the wounded surfaces in order to keep them in position, than to depend on one or two thick skeins. I am led to form this opinion from the result in the case of excision of the knee. If it is ever necessary to use a skein of more than sixteen threads, one thread of catgut prepared in chromic acid should be added to act as a drain, if required, during the absorption and the molecular disintegration of the drain. Chromic-acid gut should also be used to stitch the drain in position when such a procedure is necessary.

As regards the thickness of the gut, I have used three thicknesses. The finer the gut the more numerous and the smaller will be the capillary tubes between the threads. The fineness of the gut will not interfere with the capillary action through the threads. For these reasons, I am of opinion that the finest gut should be used; by its use, the better will be the drain for any given thickness of skein.

It may be a question how much of the action is due to capillarity through and between the threads, and how much to the drain acting as a lead to the discharges. Capillarity has, I believe, the chief place.

I have hitherto used the gut prepared in the usual way by soaking in carbolic oil. Simple soaking of the drain in carbolic lotion for a quarter of an hour before using will be sufficient in cases in which prepared gut is not at hand.

As long as the drain is acting, there will be a current of fluid along and around the threads (as well as in them), separating them from the living tissue, by means of which the process of absorption mainly takes place. When the flow ceases, then absorption of the column of fluid will first take place, the living walls of the canal will then reach the threads, and absorption will then commence. If this is a true explanation of what happens, then it is evident that it will not be necessary to use catgut specially prepared (as Mr. Lister, for instance, has shown by chromic-acid) in order to delay absorption.

Further experiment may show, that in many wounds, all that will be necessary will be to bring the catgut ligatures out at the corners of the wound instead of cutting them short. This was my first idea; but I have been so satisfied with the skein, that I have not yet made trial of it.

I make no allusion in this paper to the use of catgut in draining suppurating wounds, or in wounds not treated antiseptically.

I beg to recommend, as worthy of the notice of the profession, the principle of drainage by utilizing capillary forces through skeins of an absorbable material like catgut, if, by its use, the evils of the drainage-tube, already referred to, are got rid of.

We may now anticipate a time when, with catgut stitches instead of silk, horse-hair, or silver wire, catgut drains instead of india-rubber tubing, and chromic-acid gut fixing together the buttons instead of silver wire, it will not be necessary to uncover our wounds from first to last during healing, when the deep dressing need never be shifted, and when the outer dressing will only require to be removed when soaked with discharge. The amount of discharge, in its turn, will be reduced to a minimum by the use of an absorbable animal material like catgut instead of non-absorbable foreign bodies like silk, silver wire, and india-rubber.

A greater simplicity in the practical details of the antiseptic treatment of wounds will undoubtedly further the spread of a most revolutionary, and therefore necessarily much opposed, system. Efficient drainage is an essential to success. If the method of drainage which I here advocate is of efficacy equal to the drainage-tube, it certainly is simpler in its application.—*Edinburgh Medical Journal, Sept.* 1876, *p.* 225.

47.—ON THE TREATMENT OF SEVERE SPRAINS.

By SAMPSON GAMGEE, Esq., F.R.S., Edin., Surgeon to the Queen's Hospital, Birmingham.

"Severe sprains are often serious fractures, though no bone be broken, or only a bit may be chipped off; the ligaments and fasciæ are ruptured, blood being extravasated into the joints, into the sheaths of tendons, and for some distance not infrequently between the layers of muscles. The swelling is great, the pain intense. The orthodox treatment by leeches and fomentations is valueless, compared with circular compression and perfect immobilisation." (Gamgee on Fractures, 1871.)

Personal experience only adds strength to this opinion, and yet the orthodox antiphlogistic treatment continues to find favour with authorities. To quote one of the most recent and distinguished: "As to severe sprains, at first, while the active state of effusion is present, antiphlogistic measures are necessary. Where it is grateful to the patient, the sedulous application of ice-bags is, I think, the best; but if this is not tolerated, leeches, followed by warm fomentations or evaporating lotions, or irrigation with spirit and water, will best check the tendency to effusion. As soon as the patient can bear it, equable pressure by strapping and bandage or by splints, with perfect rest, should be adopted." Not only can the patient bear well-applied pressure from the first, however great the swelling and acute the pain, but it may be laid down as a general proposition, to which I have never seen an exception, that in, severe sprains, effusion is most surely checked, and, once it has occurred, its absorption is most rapidly promoted, while pain is most effectually relieved, by pressure and immobilisation. It is as true now as when Velpeau taught it, that "compression is the sovereign resolvent in contusions with infiltration and swelling."

By way of illustration, I may briefly relate the progress of a case in which I was consulted by my friend and colleague Mr. John Clay. His patient, an elderly gentleman, had recently sprained his right ankle in going over a ploughed field. As he had a policy in one of the accidental insurance companies, its medical officer saw the case, and he advised an incision to give vent to matter, which he thought had formed in the centre of the swelling. In this advice he was sustained by a hospital surgeon, who was additionally called in on behalf of the company. Mr. Clay, dissenting, invited my attendance. I found the right ankle hot and exquisitely painful. It was so much swollen that its circumference over the heel exceeded that of the corresponding sound joint by nearly an inch and a half. The skin on the outer side of the ankle was especially hot, red, tense, and shining; palpation in this situation communicated

a feeling of elasticity closely simulating, but not amounting to, fluctuation. With Mr. Clay's concurrence and assistance I enveloped the limb from the toes to the knee in fine cotton-wool, applied well-moulded pasteboard splints on each side, bandaged with methodically uniform compression, and starched the outside. A second consultation was held in the course of three days, when I found the patient very much easier. He had had a good night's rest and had been able to turn over in bed, and could bear the limb lifted and put down again without pain. On opening the apparatus in front I found the swelling had considerably decreased; the previously red skin was yellowish and shrivelled like the skin of a late russet apple, not looking, as at my first visit, like the red shining skin of a prime Blenheim. That shrivelled look is always a good sign. I pared the edges of the case, and readjusted with firm pressure. Three days later more shrinking was met by fresh paring, and still firmer bandaging. At a consultation held a fortnight after the first, the patient was perfectly easy. No one thought any more about puncturing in search of matter. The insurance company compromised the affair by paying down a substantial sum of money, and I replaced the pasteboard apparatus by strapping the joint with emplastrum elemi spread on leather, and a Churton's bandage applied with smooth firmness. When I last saw the patient with Mr. Clay, he was walking about his garden with a stick; the plaster had been very properly removed, and the swelling had subsided, the only difficulty to locomotion being stiffness of the joint. I cracked the adhesions by using the requisite amount of well-applied force, and we concurred in advising free use of the joint. In a note which I received from my colleague seven weeks after our first consultation, he wrote: "Our patient is progressing very satisfactorily; he comes to business every day, walks about a good deal, and does not require surgical supervision."

The case is a typical illustration of the proposition that severe sprains require immediate compression and absolute immobilisation.—*Lancet, April* 29, 1876, *p.* 629.

48.—A SHOE FOR THE TREATMENT OF CLUB-FOOT.

By Richard Barwell, Esq., Surgeon to the Charing Cross Hospital.

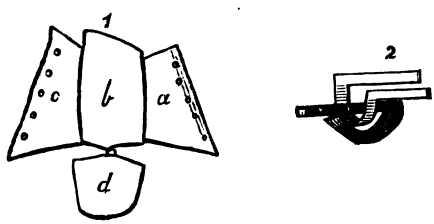
I desire to describe a form of shoe by which the less severe distortions of the foot may be successfully combated without any other treatment whatever, which is, while being worn, hardly perceptible, and which permits the patient to walk and run about with ease. It was, however, designed, and is especially useful as a succedaneum to what has become named "Bar-

well's treatment of clubfoot," concerning which a few words will be said in the sequel. There comes in this treatment a period when, certain shortened muscles having been sufficiently stretched, the foot requires but little force to keep it in position, and when exercise of the limb becomes desirable. Dr. Lewis Sayre, following out my principle of acting chiefly on the front half of the foot by elastic force, devised a shoe, which he showed in this country in 1870, A precisely similar arrangement has been described by Mr. Dixon, who, as he did not mention the previous invention, was not, we must suppose, aware that the shoe had then been made by Messrs. Weiss for many months.

The principle of the Sayre shoe may be described as a division into two at the waist of the foot of an ordinary boot, the two parts being united together at the sole by a ball and socket. The heel compartment carries two leg-irons united at the top by a calf-piece, whence india-rubber springs act on the front of the boot and on the foot inside it.

Two slight modifications were made at my suggestion by Messrs. Weiss with considerable advantage—namely, substitution of a pivot and two hinges for the ball and socket, and the introduction of india-rubber sheeting at the gap between the two parts of the sole so as to prevent the entrance of water to the foot and of grit to the joint. Nevertheless, certain disadvantages remain which I have obviated by a different form of boot, in the carrying out of my plan having been ably assisted by Mr. Hawksley.

The sole of the shoe is made of steel (plate-gauge No. 21), and is divided into two parts at a level with the medio-tarsal joint; the line of division must not run straight across, but in both parts must incline obliquely from the middle line to allow of play between the parts (Fig. 1, (*b*, *d*); along the margins



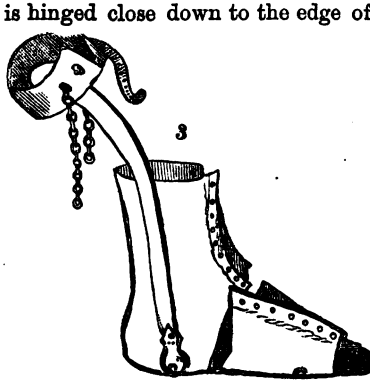
the metal is perforated with small holes for convenience of stitching.

The posterior part (*d*) must be made rather narrower than the tracing of the foot, and must be bent up behind corresponding

with the shape of the lower surface of the heel; to this part is attached the upright of which more hereafter.

The front portion (*b*) must be made considerably narrower than, and not quite so long as, the tracing of the foot. On each margin, a little behind the place where the metatarso-phalangeal joint will come, a small steel wire bracket is placed. This portion and the heel part are jointed together by a somewhat peculiar mechanism made of sufficiently thick steel wire (gauge No. 15). That half of the joint which is to be affixed on the lower surface of the heel-plate is made by bending a piece of the wire till the centre forms a bow, while the straight ends lie, about one-third of an inch apart, parallel. The bow must be accurately semicircular, and is to be bent down till the plane of the bow and that of the parallel lines lie at a right angle to each other (Fig 2, the white portion). The other part of the joint is made of equally thick wire, bent upon itself so as to enclose the semicircle above described. It is essential that this wire be bent in the manner depicted (Fig. 2, the dark portion)—that is, the upper limb must be perfectly straight. If the whole limb be curved like the link of a chain the joint misses its object; the front half of the sole will not rotate round the straight wire in the middle line, but will move round the semicircle, thus the middle line diverges to one or the other side and the joints get "jammed."

The rest of the steel foundation consists of the upright; this is hinged close down to the edge of the heel-plate, always on the outer side. From the hinge a stiff portion runs upward from an inch to an inch and a half, according to the size of the foot. It must be concave, and so bent outward as not to press, not even to touch, the limb when *in situ*. The rest of the upright part is a spring which carries the calf-piece; it is curved outward for varus, inwards for valgus. Fig 3 represents it as for the former deformity, and in such cases there is fixed to the pivot on which the hinge rotates, therefore always stationery, a minute ring or hook. The calf-piece carries on each side an eye to which a small chain is attached.



All the steel sole, back and front, are separately covered with strong canvas, and to these parts are attached the lappets for

lacing on the foot. These must be well made to measure, so as not quite to meet, and the foot must be protected from the laces by an inner tongue for each portion. The back part must be well hollowed out above the heel, to prevent the foot lifting away from the sole. The shape of the front lappets must be well looked to; their posterior edges must be in a straight line with each other, or even diverge a little backwards (Fig. 1, *a. c.*). This is very important, and I have had some difficulty in enforcing this point, makers and coverers being apt to make the upper free edge of the canvas equal in length to the edge which is sewn to the sole. A shoe thus made will fail.

In putting on this shoe the back portion must be laced first, taking care to place the steel heel well at the bottom of the patient's heel, whether it be turned inwards or outwards. Place the shoe in the same posture as the foot, but do not press the foot straight to fit a horizontally placed shoe. The same thing must be said of the front half; it is to be bent or twisted to the posture of the foot, and so laced. The spring of the upright is now to be brought in position, and the calf-piece strapped round the leg. When all is fixed, an india-rubber spring—a very small accumulator of $\frac{1}{4}$-inch cord, on which two steel hooks are bound—is to be stretched with proper tension between the chain suspended from the calf-piece and the little bracket on the inner side, if the case be valgus; on the outer, if it be varus. It is convenient, generally, not to fix the hook directly into the little bracket, but to a loop of catgut passed through it. In the case of varus, also, a piece of catgut is passed from the bracket backwards through the little ring or hook at the hinge, where it bends at a right angle, running thence upwards to a small accumulator, after the direction and manner of the peroneus brevis tendon.

When this shoe has been made, a bootmaker must measure over it for an ordinary high or Polish boot. If he be a good tradesman he will make a pair whose slight difference in size will be hardly perceptible, and the height of the boot will conceal the whole mechanism. The weight of the inner or mechanical shoe is so slight that it may practically be disregarded; one now on my table, which is used by a child of six, weighs three and a quarter ounces. The bootmaker, by letting the sole of the outer boot be a little thinner—to compensate for the thickness of the inner boot—can easily equalise the balance of the two feet.

This shoe is a most valuable aid to the treatment of club-foot by elastic extension, a method which has gained and is gaining ground with thoughtful surgeons, to whom ultimate results are of the highest importance. It is with satisfaction that I can point to several hospitals and to many surgeons whose testimony

confirms this, rather than controvert by my own personal experience the strongly expressed opinions of Dr. Buchanan.—*Lancet, June* 24, p. 917.

ORGANS OF CIRCULATION.

49.—ON A CASE OF SUCCESSFUL LIGATURE OF BOTH EXTERNAL ILIACS FOR INGUINAL ANEURISMS.

By Dr. EBEN. WATSON, M.A.. Surgeon to the Royal Infirmary, Glasgow.

I have the pleasure of calling your attention to a very rare occurrence in surgery—namely, the successful ligature of both external iliacs for inguinal aneurisms. The patient is the same Thos. M'C., whom I introduced to your notice at the beginning of the present session. I then described to you the history and results of ligature of the *left* iliac for inguinal aneurism, performed by me on the 1st May, 1875. I now show you the man cured of aneurism of the right common femoral by ligature of the *right* iliac artery, which I performed in your presence on the 19th January, 1876; that is, eight months and nineteen days after the previous operation. In Mr. Erichsen's "Surgery" you will find reference made to a similar case, in which Mr. Tate tied both iliacs successfully, at an interval of eleven months between the operations. I do not know of any other such case on record.

After the first operation M'C. remained quite well, and was able to resume his work as a shoemaker; but on the 17th November, 1875, he returned to the hospital complaining of violent headache, or rather of a violent pain on the right side of the head, said to be quite of peculiar nature. Ordinary remedies had no effect on this pain, and I began to wonder if it could be due to some intracranial aneurism. I did not, however, make out any bruit; and as the man had once had syphilis, I put him upon full doses of iodide of potass, on the theory that the headache might be periostitic in its origin. Soon afterwards the pain rather suddenly ceased, and the man declared himself quite well on the 24th November.

Nevertheless, he remained in the hospital, chiefly because I wished to show him to you, and to the Medico-Chirurgical Society of Glasgow. As before, he made himself very useful in the wards, but was not allowed to do any heavy work. It was only on the 27th of December last that he told me in passing through the wards that there was an unusual beating in his right groin, as if he had another aneurism there, and on examination such turned out to be the truth. The tumour was in the site of the common femoral, just under Poupart's ligament, as large as a walnut, pulsating freely in all directions, and

yielding a loud aneurismal bruit when listened to with the stethoscope. I immediately ordered rest in bed, and compression only with a sand-bag, because of the tenderness of a gland which was situated close to the aneurism.

Unfortunately the patient could not endure any form of pressure. I tried the abdominal compressor in several positions above the aneurism, and Signoroni's tourniquet further down. I even applied Carte's circular tourniquet below the aneurism, and on the tumour itself, but all to no purpose, and the man himself begged me to tie the vessel, as I had done before, on the other side. By this time the aneurism had considerably increased in size, and now measured three inches in length. The bruit was very loud, and a grating sensation was communicated to the hand when laid on the tumour, just as if the blood-current was displacing coagula in the sac as it passed through. A consultation of the surgical staff of the hospital agreed with me that ligature of the right external iliac should now be performed, and therefore, having put the man on low diet for a few days, and gently opened his bowels, I performed the operation on the 19th of January.

The limb was carefully wrapped in cotton-wool and flannel, and chloroform was administered, but he went under its influence with difficulty, had frequent attacks of retching and coughing, and occasionally during the operation came partially out of the anæsthetic stupor. His condition, therefore, was not such as made the operation easy, and it also happened that, after making the ordinary incisions through the skin, aponeurosis, and muscles, I found it very difficult to separate the transversalis fascia from the peritoneum; in fact, I punctured the latter in scratching through the fascia, the unsteadiness of the patient and his not being thoroughly under the chloroform at that moment having much to do with this error. However, immediately recognising the mishap, I closed the puncture with a single stitch of catgut, and proceeded with the operation, which I speedily completed without further difficulty. I dare say that the trial of compression on this side served to condense the areolar tissue, which is usually found loose and easily torn between the transversalis fascia and the peritoneum. The pulsation in the aneurism was at once arrested, and never for a moment returned. Its size was also greatly diminished on the ligature being tightened. I ought to mention here that the ligature was of silk, prepared as before by being drawn through melted wax and carbolic acid. It was cut short at the knot, and after the carbolic spray had been freely used, the wound was closed with stitches of silver wire, a drainage-tube of oil-silk having been inserted at the upper extremity. Next day I removed the dressings and extracted the drainage-tube, as there

was no discharge at all, and not the least tenderness on pressure. There was, however, considerable flatulent distension of the abdomen, constant sickness, and occasional vomiting. His pulse was 72 and his temperature 99°. I ordered him a calomel-and-opium pill twice during the day, and one of colocynth and henbane at night. Nevertheless he continued to vomit frequently until next day, when his bowels were freely relieved by an enema. The abdominal distension at once disappeared, and, in fact, he was quite well.

He was kept on mild, soft diet, and had no bad symptom after the second day—in fact, after he recovered from what I believed was a bilious attack, increased by the effects of the chloroform, which evidently disagreed with him both at the time of its administration and afterwards. The wound was frequently dressed, and healed rapidly without suppuration. By the 10th of February it had completely cicatrised, and the dressings were discontinued.

Six days after the operation it is noted in the journal that the blood in the aneurismal sac felt quite solid, and by the time the wound was healed its size had greatly diminished. It is now represented by a small hard mass, of a flattened form, underneath Poupart's ligament.

The patient's diet was improved, and he was allowed to sit up in bed. In doing so he seemed to have bruised or irritated a gland in the iliac region outside of the cicatrix, and it was painful for a day, but a poultice soothed the pain, and the swelling very soon entirely disappeared.

Almost all restrictions were now removed, and the patient is reported on March 4th as being out of bed most of the day. It will be noticed that in this case the wound was firmly cicatrised in twenty-two days, and the patient was well and out of bed in six weeks from the date of the operation.

I am glad to be able to show you this man to-day (7th of June), nearly six months after the second operation was performed. He has been quite well since then, and only now complains of weakness of the abdominal parietes, where the incisions were made, and where you saw a considerable bulging when he coughed. I believe that a double truss with large and flat heads will be the best remedy for this state of parts.

I also beg you to note that there is no fulness or tenderness in the site of either ligature. In both iliac regions the parts seem to be quite healthy, with the exception of the obliteration of the arteries there, which is complete.

This case therefore proves that prepared silk ligatures may be applied on the continuity of an artery, and neither cut it nor produce suppuration, for both of these ligatures still remain, I believe, around the iliac arteries where I placed them, the one

thirteen months, the other six months ago. As to the exact state of these ligatures, the best information I can give you is the following:—On the 15th of last January I assisted the late Dr. Dewar to tie the femoral artery with a silk ligature prepared as mine were. Unfortunately the patient, who was an old man and otherwise ill at the time of the operation, only lived for twenty-four hours. I examined the artery and ligature carefully after death, and found that the latter had ruptured the internal and part of the middle coats of the former, the rest of the arterial wall remaining sound. The parts of the coat which had been ruptured were turned in towards the centre of the tube, and glued with lymph and clot. The ligature was buried in lymph, and, on cross section was seen to be already intruded into by the cellular elements. I have little doubt that its fibres would have soon been further separated and encapsuled by the lymph, and thus preserved from change. Such I believe to be the state of the ligatures in my case. They are still holding the arteries, but they are, by this time, so incorporated with living tissue that they may continue there indefinitely, without causing any disturbance or irritation.

At the time when this man's case was interesting us all—namely, last winter—I made some experiments upon the durability of catgut ligatures in the living body. More perfect ones might easily be devised, and I may yet pursue the subject further; but in the meantime I shall give you the results we arrived at.

Exp. 1.—Three catgut ligatures, prepared as usual for surgical purposes and of different thicknesses, were tightly tied round a piece of wood and immersed in blood freshly drawn from a man's arm. In twenty-four hours' time no appreciable change in the ligatures had taken place. The knots on the ligatures were quite firm, and the ligatures themselves were not thinned. My notes do not contain any indication of a later inspection of the ligatures.

Exp. 2.—Three similar catgut ligatures were employed, and a double knot was firmly tied on each. They were then pulled through a sinus in a man's leg, as a seton, so that the knots were embraced by the tissues and bathed in the sero-purulent discharge of the sinus. In six hours there was no appreciable difference in any of them. But in thirteen hours the ligature of smallest size had entirely liquefied and disappeared. That of medium size had become soft and diminished in thickness, so that the knot slipped on being slightly pulled; in fact, the ligature actually broke on slight traction being made on it. The third ligature, which was of the thickest catgut used in surgery, had also very much thinned; the knot on it slipped readily, but it did not break.

Exp. 3.—Again three catgut ligatures, similar in all respects to those previously used, after having been knotted, were inserted in an abscess recently opened. In six hours the catgut was bleached, but not otherwise changed. In thirteen hours the ligature of smallest size was softened, and the knot did not hold, while the others were unaffected; but after twenty-four hours' residence in the pus, all were found softened, thinned, and incapable of retaining the knot.

I ought to have stated that in Exps. 2 and 3 antiseptic dressings were employed, and in neither case was the pus at all putrid.

The question now comes to be whether or not the time—less than thirteen hours—is long enough to hold an artery with a ligature for the cure of aneurism; and the practical answer which must be given is that in *some* cases it would seem to have been long enough, while in others it was not. My experiments would seem to show that if suppuration is entirely prevented, the catgut ligature will hold for twenty-four hours, or perhaps even longer; but as no surgeon can be certain of securing that condition, especially in deep wounds and in unhealthy patients, the propriety of employing catgut ligatures in such cases is rendered doubtful; whereas the successful case of ligature of both internal iliacs now before you goes far to prove the safety and the certainty of prepared silk ligatures in such cases, and the length of time which has elapsed since the operations greatly strengthens this conclusion.—*Lancet, August* 12, 1876, *p.* 213.

50.—POPLITEAL ANEURISM; LIGATURE OF FEMORAL WITH CARBOLISED CATGUT; CURE.

Under the care of Dr. SHEEN, at the Cardiff Infirmary.

William R., aged 36, labourer, was admitted into the infirmary on May 23rd, 1876, suffering from aneurism in the right popliteal space and great œdema of the leg. He stated that he first felt a cramp in the back of the knee, with shooting pain down the calf, about nine weeks before admission, which he was unable to account for. He had only a few days previously been discharged from the Bristol Hospital, having suffered from a compound fracture of the lower jaw, which was not quite healed when he entered the infirmary. He stated that he had a blow on his leg when he fractured his jaw in March, but he could not remember anything further about it. He had to give up work four or five weeks ago on account of the pain and swelling in his leg. Measurement: Right knee, 18½ to 19 inches; left knee, 15 inches. Carte's tourniquet

was applied, but was given up in a week, owing to the treatment not being efficiently carried out.

On June 9th (seventeen days after admission) the diameter of the right knee was about half an inch greater. The femoral was tied about the apex of Scarpa's triangle, which lay very deep, owing to a thick layer of superficial fat. The greater part of the operation was done antiseptically, until the apparatus slipped out of the assistant's hands on to the floor. The carbolised catgut ligature, which has been used for some years at the infirmary, was used in this instance with perfect confidence in the result, as there has never been an accident with it yet at the infirmary. No chloroform was given. The edges of the wound were brought together with silver-wire sutures, and a drainage-tube having been inserted, the wound was covered with antiseptic gauze and bandage, and the whole limb enveloped in cotton wool.

June 11th (third day.) Limb cold for some hours after the operation, but got warm about five p.m. Wound dressed today for the first time antiseptically. No redness: slight serosanguinolent discharge; no smell. Line of incision healed except at lower part. Drainage-tube cleaned and replaced.

13th. Dressed again; scarcely any discharge; no pain.

18th. Wound completely healed; stitches taken out; drainage-tube dispensed with. There was not the slightest rise of temperature throughout, and the patient's diet was never changed.

28th. Swelling much decreased, and whole leg and tumour much more supple. No pulsation in latter. Sensation at toes not so good as in other foot, but is improving rapidly. Measurement at knee, 17 inches. To get up and move on crutches.

July 13th. Doing well. Made an out-patient.

Remarks by Dr. Sheen.—The chief interest of this case is the use of the carbolised catgut ligature. About six months ago Mr. Holmes brought forward a case at the Clinical Society, and the question of the use of the carbolised catgut ligature was very fully discussed. In the tying of all vessels at the Cardiff Infirmary we have used nothing but this ligature for several years, and the few cases we have had of tying vessels in their continuity have done remarkably well. By the courtesy of my friend and colleague. Dr. Taylor, I am enabled to mention two cases which were under his care, and which did well.

1. M. B., aged forty. Popliteal aneurism. Admitted March 19th, 1873.—March 21st: Tourniquet applied.—April 21st: Carbolised catgut ligature, and ends cut off. Wound healed by first intention. [This case was treated in a tent in the infirmary grounds.]

2. W. B., aged thirty-eight, admitted December 21st, 1875. —Dec. 29th: Similar operation.—Jan. 22nd, 1876: Discharged cured. This man had been treated by pressure in a Cork hospital some years before, and had a deep scar the size of a five-shilling piece directly over the femoral artery, which could be felt pulsating just beneath.

Both these were very interesting cases.

It is surprising to see how curtly our text-books speak of the catgut ligature. Surgeons in all parts of the country doubtless use the catgut ligature in the treatment of aneurisms, and yet Bryant, in his second edition, published within the last few months, scarcely mentions it. Chloroform was not given in this case. Bryant states, "it need hardly be said that chloroform should always be given in these cases." But this is really not necessary. The first incision is the only painful one, and if a patient have a fair amount of courage I should not be inclined to give chloroform unless a decided wish to have it was expressed.

It seems only reasonable to suppose that a trial of the treatment by pressure for some days, though it fail to cure the aneurism, should facilitate the establishment of the collateral circulation after the operation of applying a ligature to the main vessel. I think I have seen it so stated in surgical works. And yet Mr. Holmes tells us, in his lectures delivered before the Royal College of Surgeons in 1874, that the mortality in such cases is greater than in those where the ligature is applied without any attempt at treatment by pressure. — *Lancet*, *Aug.* 12, 1876, *p.* 222.

51.—ON A CASE OF POPLITEAL ANEURISM, TREATED SUCCESSFULLY BY THE APPLICATION OF AN ESMARCH'S BANDAGE.

By Dr. WALTER REID, Staff Surgeon, Royal Naval Hospital, Plymouth.

On the 11th of September, 1875, a case of popliteal aneurism was cured in fifty minutes by the application of an Esmarch's bandage, and the cure remained complete. The aneurism ultimately ceased to give either trouble or inconvenience, and the remains of it could only be distinguished by comparison with the opposite limb.

But, unhappily, the general health of the patient had been broken down by much arduous service in the tropics. He became subject to a troublesome cough, accompanied by paroxysms of distressing dyspnœa. He was readmitted into this hospital on the 3rd of June, and died on the 7th. The cause of death, as ascertained by post-mortem examination, was hypertrophy

of the heart, associated with bronchitis, effusion into both pleuræ, and cirrhosis of the liver. There was no internal aneurism, and the coats of the large vessels appeared to be sound.

The remains of the aneurism in the left popliteal space were removed and examined. The tumour, when cleared, was of the size and general form of a small walnut. The artery was occluded for 2½ inches of its course by fibrous tissue, and from the lower half of this portion the aneurism sprang. The popliteal vein was pervious throughout. Numerous collateral branches could be seen running into the artery above and below the occluded portion. On making a section of the tumour in the long direction and from the side opposite the artery towards the vessel itself, the following appearances presented themselves:—The sac was well defined, being thicker where it joined the artery than elsewhere. The centre and also that portion of the cavity adjacent to the vessel were occupied by an amorphous, non-laminated, coffee-coloured substance, of the consistence of cheese, which showed no signs of organisation or of vascular connexion with the surrounding parts. That portion of the circumference of the cavity of the aneurism opposite its mouth was occupied by several layers of laminated fibrine. Some of these were partially separated from the others and approximated towards the centre, the interspace thus caused being filled by the amorphous substance, which, however, was of a looser character than that already described.

The amorphous, non-laminated substance could be nothing else than the remains of an ordinay blood-coagulum, and, since the aneurism was originally the size of a hen's egg and finally that of a small walnut, it could only have represented a small proportion of the original bulk of the clot. The fibrinated laminæ were probably due to the attempts which I made at cure by compression, and the displacement of some of these resulted from the contraction of the sac upon them subsequent to the cure. I think so, because the coagulum in the interspace was soft and loose, and seemed to represent a portion of the more fluid parts of the larger mass which had been expressed from it, likewise by the contraction of the walls of the sac.

In my pamphlet, which was written a month previous to the death of the patient, I attempted to show that the aneurism was cured by the rapid coagulation or death of the blood consequent upon its complete stagnation in the sac. I think that this explanation is well borne out, not only by a consideration of the phenomena of cure, but also by the post-mortem appearances.

I beg here to acknowledge the numerous communications that have reached me from surgeons, generally expressing an inten-

tion to try this method on the first opportunity. I am accordingly in hopes that it will ere long be determined as to whether the success which may follow its application shall only be looked upon as a rarity, or whether it may be destined to revolutionize the whole surgical treatment of aneurism, and enable us to treat the disease in certain situations with the regularity and precision of a physical experiment. — *Lancet, Aug. 5, 1865, p. 184.*

32.—LARGE VENO-CUTANEOUS NEVUS TREATED SUCCESSFULLY BY REPEATED INJECTIONS WITH CARBOLIC ACID.

By S. Messenger Bradley, Esq., Surgeon to the Manchester Royal Infirmary.

A female infant, about eight months old, was brought to the out-patient room of the Manchester Infirmary last November, with a large and prominent nevus situated above and extending into the helix of the left ear. The tumour, which involved the cutaneous capillaries as well as the veins beneath, measured two inches and a half by one inch and a half, and was raised half an inch above the level of the surrounding skin. I resolved to treat the case as Lister advises, by the injection of carbolic acid: but first, to prevent any risk of embolism, I transfixed the base of the tumour with two long hair-pin pins at right angles to each other, and strangled the entire mass with a ligature tied tightly beneath the pins. I then injected five minims of pure carbolic acid, dispensing it as evenly as possible in minim doses here and there over the whole tumour. The ligature was cut, and the needles removed in ten minutes. Little if any change was apparent three days later, when I repeated the process. After a further lapse of four days, no improvement being perceptible, I ligatured the nevus by means of a Ferguson's knot, and admitted the child into the hospital: its cries, however, were so piteous and continuous, that the house surgeon was compelled to remove the ligature in about six hours, and I do not think that its introduction contributed in any material degree to the successful issue of the case. The following week I again resorted to the injection, and repeated it at intervals of four and five days: but it was not until three weeks had elapsed, and the injections had been employed half-a-dozen times, that any diminution was perceptible. At this period, however, a decrease became manifest, and this decrease steadily progressed, although no further injection was used. From week to week until now March 14th the tumour is no longer at all raised above the level of the surrounding skin, and the integument has almost entirely regained its natural character and colour.

The point of chief interest here appears to be the gradual but very continuous action of the acid. Probably success would have been equally attained by fewer injections; and, in the next case of the kind, I should allow an interval of a week or ten days between the operations. But the really important fact seems to be, that we can confidently count on success by this safe and little unpleasant method; and when we reflect upon this fact, and at the same time call to mind the potency of electrolysis in the treatment of aneurism, where the long-continued result following the operation closely resembles the action of injections in nævus, we are led to conclude that the entire chapter of the treatment of vascular tumour will have to be rewritten.

The remarkable way in which the stained skin recovered its normal colour in this case induced me to ponder upon the possibility of removing simple capillary nævi, or "mother's marks," which sometimes cover large portions of the body; and, at last, it occurred to me, that the desired end might be achieved by "tattooing" such marks with carbolic acid. On this idea I acted, and tattooed the first case that presented itself; the result answered my utmost expectations, for, in about three weeks, the port-wine stains quite disappeared, its place being taken by a cuticle of natural colour. It is true that the nævus in this case did not exceed half-a-crown in diameter, and, up to the present time, I have had no opportunity of testing the efficacy of this plan upon large surfaces; but this I shall certainly do the first chance that offers, and will, if permitted, communicate the result to the British Medical Journal.

I may add, that I used an ordinary subcutaneous syringe for the tattooing, first removing the piston and withdrawing my finger from the top each time I punctured the skin, so as to permit a small drop of the acid to escape.

I am, however, having a little instrument especially made which I think will be more convenient; it consists of a hollow tube of the size of a quill-pen, with a perforated top, and terminating in a somewhat similar fashion to the teeth of certain poisonous snakes, a small groove, down which the fluid runs, opening immediately above the lancet-shaped point of the instrument.—*British Medical Journal, April* 8, 1876, *p.* 443.

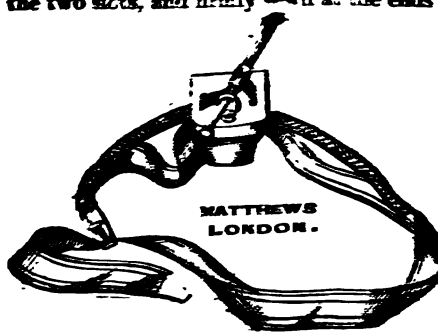
53.—ON TWO NEW FORMS OF TOURNIQUET.

By Dr. John M. Hunter, Staff-Surgeon, R.N.

The necessity of having some ready and very portable means of checking hemorrhage arising from wounds has long engaged the attention of surgeons, especially those serving in the navy and army, and before going into action a number of simple field

tourniquets are usually issued to some of the sailors and soldiers, with directions concerning the mode of their use. These tourniquets generally consist of a piece of webbing, a buckle and a pad, and are buckled on as tightly as they can be pulled. When applied on the limbs of muscular men they are practically useless, and compress the artery slightly, or not at all. A more gradual and more powerful means of compression is required. The earliest kind of tourniquet was a band, and a stick for twisting it tight, called by sailors a "Spanish windlass," and, according to Baillingall, this form was first used by Morel at the siege of Besançon in 1674.

I have designed a modification of this ancient instrument, shown in the accompanying illustration, possessing, I think, all the qualities necessary for field use. It is very light, portable, and powerful. A piece of beech, or other hard wood, about 2½ inches long, 1¼ inches broad, and from ½ to 1 inch thick, is shaped like the letter U at the top, which shape it preserves for ¼ of an inch, when it is tapered down to form an oval concave pad 1½ by 1 inch. Through the top, and over the centre of the pad, two narrow slots, or slits, half an inch broad, and half an inch apart, are cut sloping downwards and outwards, coming out where the pad begins to taper. To the underside of one of these slots, a piece of web about 4 inches long, carrying a buckle, is nailed by two copper tacks, and beneath the other a piece of web, about 15 inches long, is similarly nailed. A piece of French sennet, about 8 inches long, is passed through the two slots, and firmly sewn at the ends to the upper surface of each piece of web. A piece of iron wire 3 inches long, and gauge No. 9, sliding loosely in a small tin tube, and having a drop of solder at each end to prevent its slipping through, is placed between the two slots, and the sennet is firmly sewn around the tube, which should have a projecting flange to prevent the sennet slipping off. A picture-frame ring is screwed into the upper part of the piece of wood at the rounded end, and a piece of chamois leather is fixed by shellac-cement to the face of the concave pad. The sennet being a little shorter than the web, from pad to sewing,



takes the strain, and prevents the tacks from being pulled when it is buckled around the limb. The iron rod is used as lever to gradually twist round the sennet till a sufficient degree of compression has been reached, when it is fixed by sliding end through the ring. The sennet is made by plaiting nine eleven pieces of thickish soft twine into a common "flat plait which should loosely fill the slots. As is usual, a piece of leather should be sewn under the buckle to prevent the skin being pinched. Should the person who applies the instrument be unacquainted with the position of the artery, it is of consequence, for the closure of the vessels is effected by a general compression, as I have seen demonstrated in 1871, by Prof. Lister when performing his bloodless amputations. He used a Petit's tourniquet without any pad and placed the screw indifferently on any aspect of the limb. Professor Esmarch's elastic band still further exemplifies this.

This tourniquet, which I purpose calling the "torsion tourniquet," possesses certain peculiar advantages. The twisting is gradual and is borne by the sennet, which is capable of withstanding a torsion strain, which would break the vessels. The slots keep the power always over the centre of the limb and prevent the sennet communicating the twist to the pad which lies perfectly flat on the limb. The rod sliding in the tube can be readily fixed at any half turn, however great the strain on the tube. The instrument can be easily and cheaply made by any carpenter, and will stand any climate, whereas instruments depending for their power on the elasticity of india-rubber are unreliable when exposed to the influences of climate or long keeping.

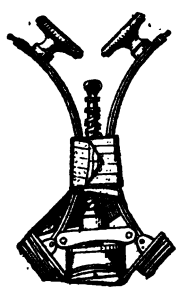
This and nearly all other tourniquets cause complete constriction of the limb, and, however useful as temporary measures, are exceedingly injurious when left on longer than two or three hours. They prevent the return of the venous blood and cause congestion, pain, and finally mortification. So serious have been the injuries produced through long-continued constriction of limbs by tourniquets, that some military surgeons have thought that more evil than good has resulted from their use. In the accounts of naval battles one often reads of the men unscrewing their tourniquets, and allowing themselves to bleed to death, rather than endure the pain of their wounds, the pain being caused, I believe, chiefly by the intense congestion produced by the constriction. After great land battles men are found who have had on tourniquets for twenty-four hours or longer, to the subsequent loss of limb or life.

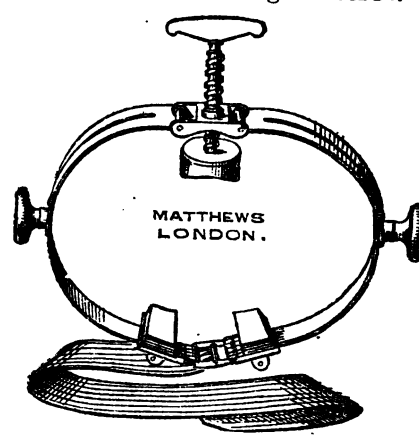
Many attempts have been made, notably by the American army surgeons, to produce a tourniquet that would allow venous return—as do the aneurism tourniquets of Carte

Skey—and yet be portable. The two best forms I have hitherto seen are Messrs. Salt's dog-collar tourniquet, made of busk-steel, described in the Lancet, August 18th, 1875, and Surgeon-Major Moffit's wing tourniquet, described in British Medical Journal, Jan. 3rd, 1874. Messrs. Salt's, from the thinness of the steel necessary for adjustment, assumes the elliptical form when the screw is tightened, and compress the limb at the sides. Mr. Moffit's is very light and compact, but is liable to be canted over, and thus displaced, in spite of the large pad used, and at the same time only a small portion of the limb is unconstricted.

Arms of tourniquets should form arcs of a circle not less than 4½ inches, nor more than 5 inches in diameter. The pain caused by the pad is very materially diminished by placing beneath it a piece of lint, which has been saturated with liniment of aconite, dried, and moistened just before use by a little water.

After making about sixteen different tourniquets, including some with the screw placed horizontally for greater snugness when on, and portable forms of Lister's tourniquet, I have produced the one shown in the accompanying illustration, which possesses the necessary qualities of allowing the screw to





make direct pressure on the artery, leaves the circumference of the limb free, excepting where the pad and point of counter-pressure touch it, thus allowing venous return, is free from danger of displacement when applied—for the pads of counter-pressure take a bearing on the limb, and keep the instrument in position,—has no loose pieces to be lost, and, finally, is suf-

ficiently portable to be carried in the pocket. The lower table of a Petit's tourniquet is removed, and an oval brass plate is substituted, carrying a thin wooden oval pad, $1\frac{1}{2}$ in. by 1 in., made concave, as recommended by Lee, and covered with a layer of chamois leather. Hinged around each spill of the upper table is a curved steel arm, $\frac{1}{4}$ in. in breadth, $\frac{1}{16}$ in. thick, and $4\frac{1}{4}$ in. long, with a curvature that causes it to measure $3\frac{3}{4}$ in. from point to point. A slot a little over $\frac{1}{8}$ in. in breadth is cut from the hinged part to within a quarter of an inch of the rounded end. Sliding beneath this is another steel arm of exactly the same dimensions, and curvative, but without a slot. One end has a slight shoulder, or turned-up part, to keep it in the same line as the first arm, and a screw with a milled head to fix it at any part of the slot in which the screw slides. At the other end of the arm is a hinged pad, $1\frac{1}{2}$ in. by 1 in., having a slot through which to attach a small piece of web to one and a buckle to the other, and on its under surface a pad of vulcanised india-rubber, $1\frac{1}{2}$ in. by $\frac{7}{8}$ in., fixed on by copper wire. When packed for carrying, the set screws are run out as far as the stops at the top of each screw will allow, and the arms turned one into the other, as shown in the engraving. When required for use the arms are turned round, and fixed by the set screw at any position desired. By this means the difficulty of getting a tourniquet that can be made small enough for the arm or large enough for the thigh is overcome. The pad is then placed over the artery, and the instrument buckled tightly around the limb. A few turns of the large screw depress the pad on the artery, and slightly raise the rigid steel bands from the limb. Its appearance when in use is shown in the third engraving. The steel being blued, and the opposing surfaces of the bands being roughened with a draw-file, prevents slipping. The instrument when closed is $4\frac{5}{8}$ inch in height and $3\frac{1}{4}$ in. in extreme breadth, giving, when opened, a span of about 16 in., sufficient to free from constriction the whole of the arm, and seven-tenths of an average thigh at its upper part. The apparatus figured here was made by Messrs. Matthews, Carey-street, and has been found to answer exceedingly well. It is not expensive, and would be of great value in the hands of surgeons of the United Service when called upon to take off the temporary tourniquets in the numerous cases where time does not permit of immediate operation, and in cases of accidents in the country, where patients have to be sent several mlies to hospital.—*Lancet, July.*

54.—ON TORSION OF ARTERIES.

By the EDITOR of the MEDICAL TIMES AND GAZETTE.

At a recent meeting of the Surgical Society of Paris, M. Tillaux read a paper (reported in the Gazette des Hôpitaux) on

the Torsion of Arteries. The conclusions at which he has arrived are the following:—

1. Torsion is applicable to arteries of all calibres, and more especially to large arteries.
2. One pair of forceps only is necessary for the operation, whatever may be the size of the artery.
3. The artery ought to be seized with the forceps obliquely, and not in its continuity, in such a way as to thoroughly include in the fangs of the forceps the three coats in their entire width.
4. Torsion ought to be carried as far as the complete detachment of the part seized by the forceps.
5. The turning back (*refoulement*) of the tunics towards the heart, advised by Amussat, and the limited torsion recommended by Amussat and the English surgeons are useless.
6. Torsion is applicable to atheromatous or inflamed arteries. It is a valuable means for checking hemorrhage at the bottom of wounds.
7. It favours the immediate union of wounds by the absence of all foreign bodies.
8. There is as much safety against primary hemorrhage with torsion as with the ligature.
9. It affords greater safety against secondary hemorrhage than does the ligature.

Since 1871 M. Tillaux has exclusively employed torsion after both great and small operations. There has never been either primary or secondary hemorrhage in about 100 great operations in which he has resorted to this practice.

Some of these conclusions will meet with the approval of all who have any practical experience of torsion; others will not, we are sure, be accepted as correct. For instance, experience does not warrant anyone in laying it down as a law that the part of the vessel seized by the forceps ought to be twisted entirely off, and it is altogether contrary to facts to say that the limited torsion recommended "by Amussat and the English surgeons" is useless. It somewhat surprised us to read that Amussat recommended limited torsion; we had an impression that Amussat twisted the end quite off, and that Velpeau and Fricke were the advocates of the limited method. Then, as to the uselessness of limited torsion. In more than one of our metropolitan hospitals, and certainly in one of our largest provincial hospitals, torsion has almost, if not quite, displaced the ligature, and has proved a most successful substitute for it; yet it is not the custom to detach the twisted end of the artery if the vessel be of large size, though it is admitted that in the case of small arteries it is immaterial whether or not this is

done. It is stated in Bryant's "Surgery" that "at Guy's Hospital up to 1874 we have had 200 consecutive cases of amputation of the thigh, leg, arm, and forearm in which all the arteries had been twisted (110 of them having been of the femoral artery), and no case of secondary hemorrhage;" and other statistics to prove the same point could be quoted from the Middlesex Hospital and elsewhere if there were need. So far from torsion short of actual detachment being useless, we would urge that it is advantageous to leave the twisted extremity undetached. The twisted end affords an additional mechanical safeguard against the occurrence of hemorrhage, while it also acts as a support to the lacerated and recurved inner and middle coats, and to the coagulum which forms within them.

It has been proved to demonstration that the twist in the external coat is a persistent condition, while it has also been satisfactorily established that the twisted portion of the artery does not die, that no sloughing ensues, but that adhesion between the parts of the artery, and between them and the surrounding structures, subsequently occurs. In all this lies the superiority of torsion over the ligature.

We do not endorse M. Tillaux's opinion that it is necessary to seize the artery obliquely, and not in a line with its axis; on the contrary, it has been our own practice to adopt the latter plan, and with good success. With well-made and fairly broad torsion forceps, quite as much of the breadth of such an artery as the femoral as is necessary can be grasped. But a point of much importance which is not alluded to by M. Tillaux is the isolation of the end of the artery by drawing it out, and thus separating it from the veins and nerves. In this, it seems to us, lies the secret of rapid and effectual torsion. As a rule, M. Tillaux is quite right in asserting that one pair of forceps is all that is necessary; but, in the case of the external iliac and axillary arteries, which are very loosely connected with surrounding structures, a second pair, to fix the vessel above, is desirable.

We are glad to find it stated that torsion is applicable to atheramotous and inflamed arteries. It has often been urged that dangerous consequences would ensue from its application to such vessels. *A priori*, it should have been argued that torsion offers less risk than the ligature for diseased vessels. In addition to the plugging by conical clot, which is the only protection in acupressure after the withdrawal of the needle, there are, in the case of torsion, the more or less perfectly incurved inner coats, and the twisted external coat of the artery, whilst the process of permanent occlusion by organised lymph is not interfered with by the ulceration necessary for the separation of the ligature. Practically it has been found that atheroma-

tous arteries are as amenable to torsion as healthy ones, if only it be borne in mind that fewer rotations of the forceps are required on account of the brittleness of the coats of these vessels; and we would add, in opposition to M. Tillaux, that the surgeon should be careful not to break away the external coat. The inference to be drawn, however, from his remarks on limited torsion appears to be this: that torsion, both in healthy and in atheromatous vessels, is actually so safe a hæmostatic that it can dispense with one of its own conditions of security, viz., the mechanical resistance offered by the twisted external coat.—*Med. Times and Gazette, July* 1, 1876, *p.* 10.

55.—ON SEVERE HEMORRHAGE AFTER TEETH EXTRACTION.

By W. G. Ranger, Esq., Assistant Dental Surgeon to St. Thomas's Hospital.

Cases of hemorrhage after tooth extraction have been recorded that are vicarious of menstruation. This can only be looked upon as a coincidence, and must be rare. General treatment is indicated.

With regard to treatment the most reliable is plugging either by a thin strip of lint steeped in a styptic, and carried completely to the bottom of alveolar cavity, and gradually doubled and redoubled upon itself until a dense and graduated plug is formed; or by pellets of cotton wool saturated with perchloride of iron, beginning with small ones, and gradually enlarging them till the alveolus is thoroughly and firmly filled, when a pad of lint or cork should be placed over the plug, the jaws closed, and a bandage passed over the head and under the chin.

The use of an impression tray either for upper or lower jaw would keep the compress in position and aid the pressure.

In cases of hemorrhagic diathesis, especially where there is a tendency to extension of bleeding over the mucous membrane of mouth, I would suggest, after the part had been thoroughly cleansed from blood, that an impression tray filled with plaster of Paris, mixed with warm water to which a little salt has been added (as the plaster then sets more rapidly), be applied as if about to take an impression of the mouth, and kept in position for twenty-four hours. By this means we should have a firm, unyielding compress all over the jaw. Wax and gutta-percha, I think, are hardly to be relied on; they are difficult of application, and not usually satisfactory when applied. The actual cautery is contra-indicated, as when the eshar comes away it merely extends the bleeding surface; and should it accidentally touch the lips, cheek, &c., would add a fresh source of danger.

Powdered matico leaf is a valuable agent in some cases. The patient should be kept in a sitting or semierect posture, in a cool room; avoidance of stimulants should be enjoined, or anything in fact likely to increase the vascular action; at the same time the importance of general medical treatment must not be overlooked.—*St. Thomas's Hospital Reports. vol.* vi., *p.* 127.

ALIMENTARY CANAL.

56.—ON A CASE OF EXCISION OF CANCER OF THE ANUS AND RECTUM, AND ON THE ACCESSIBILITY OF THE FEMALE RECTUM FOR OPERATIVE PURPOSES.

By FURNEAUX JORDAN, Esq., Professor of Surgery in Queen's College, and Surgeon to Queen's Hospital, Birmingham.

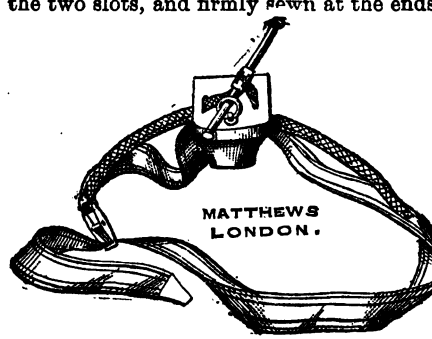
There are certain distinctions which should always be drawn in cancerous diseases of the lower end of the gut. One of these is commonly made. There is another which is not commonly, or, at any rate, not specifically, made. I will shortly put before you a few facts, which will enable you to judge for yourselves whether it should be made or not.

The distinction which as a rule is *not* lost sight of is, that the rectum proper is the seat of various kinds of malignant disease, while it is rare for other than epithelial cancer to begin at the anal opening. Scirrhus starting in the rectum may, it is true, quickly reach the anus, and epithelioma of the anus may as readily crawl up the rectum. Why it is well to draw a line between the tube and its outlet, is seen in many ways. The anus is very accessible; no canal, or cavity, or big vessel, or big nerve lies very near it. Above all, the cancer which seizes upon it is of all cancers the most local in its origin, the mildest in its course, the least likely to return after removal. Bear in mind that I am speaking now of epithelial cancers generally. I do not say that epithelioma of the anus is less grave than epithelioma elsewhere. On this point I have little to say, save that site goes a long way in determining the career of a cancer. I once saw an epithelioma seated over the sternum which had grown for thirty years, and seemed likely to grow another thirty; on the other hand, I have seen an epithelioma of the tongue run as rapid a race as an encephaloid cancer. Position is but one of many influences which guide the clinical course of a malignant growth.

The other distinction which, I believe, is not commonly made is, that the female rectum, from a surgical point of view, is a totally different organ from the male rectum. It is different in size, and, what is more significant to us, it is very different in its relations and accessibility. A woman's rectum, with its

tourniquets are usually issued to some of the sailors and soldiers, with directions concerning the mode of their use. These tourniquets generally consist of a piece of webbing, a buckle and a pad, and are buckled on as tightly as they can be pulled. When applied on the limbs of muscular men they are practically useless, and compress the artery slightly, or not at all. A more gradual and more powerful means of compression is required. The earliest kind of tourniquet was a band, and a stick for twisting it tight, called by sailors a "Spanish windlass," and, according to Ballingall, this form was first used by Morel at the siege of Besançon in 1674,

I have designed a modification of this ancient instrument, shown in the accompanying illustration, possessing, I think, all the qualities necessary for field use. It is very light, portable, and powerful. A piece of beech, or other hard wood, about $2\frac{1}{2}$ inches long, $1\frac{3}{4}$ inches broad, and from $\frac{3}{4}$ to 1 inch thick, is shaped like the letter U at the top, which shape it preserves for $\frac{3}{8}$ of an inch, when it is tapered down to form an oval concave pad $1\frac{1}{2}$ by 1 inch. Through the top, and over the centre of the pad, two narrow slots, or slits, half an inch broad, and half an inch apart, are cut sloping downwards and outwards, coming out where the pad begins to taper. To the underside of one of these slots, a piece of web about 4 inches long, carrying a buckle, is nailed by two copper tacks, and beneath the other a piece of web, about 18 inches long, is similarly nailed. A piece of French sennet, about 8 inches long, is passed through the two slots, and firmly sewn at the ends to the upper surface of each piece of web. A piece of iron wire 3 inches long, and gauge No. 9, sliding loosely in a small tin tube, and having a drop of solder at each end to prevent its slipping through, is placed between the two slots, and the sennet is firmly sewn around the tube, which should have a projecting flange to prevent the sennet slipping off. A picture-frame ring is screwed into the upper part of the piece of wood at the rounded end, and a piece of chamois leather is fixed by shellac-cement to the face of the concave pad. The sennet being a little shorter than the web, from pad to sewing,



takes the strain, and prevents the tacks from being pulled out when it is buckled around the limb. The iron rod is used as a lever to gradually twist round the sennet till a sufficient degree of compression has been reached, when it is fixed by sliding one end through the ring. The sennet is made by plaiting nine or eleven pieces of thickish soft twine into a common "flat plait," which should loosely fill the slots. As is usual, a piece of leather should be sewn under the buckle to prevent the skin being pinched. Should the person who applies the instrument be unacquainted with the position of the artery, it is of no consequence, for the closure of the vessels is effected by the general compression, as I have seen demonstrated in 1871, by Prof. Lister when performing his bloodless amputations. He used a Petit's tourniquet without any pad and placed the screw indifferently on any aspect of the limb. Professor Esmarch's elastic band still further exemplifies this.

This tourniquet, which I purpose calling the "torsion tourniquet," possesses certain peculiar advantages. The twisting is gradual and is borne by the sennet, which is capable of withstanding a torsion strain, which would break the web. The slots keep the power always over the centre of the pad, and prevent the sennet communicating the twist to the web, which lies perfectly flat on the limb. The rod sliding in the tube can be readily fixed at any half turn, however great the strain on the tube. The instrument can be easily and cheaply made by any carpenter, and will stand any climate, whereas instruments depending for their power on the elasticity of india-rubber are unreliable when exposed to the influences of climate or long keeping.

This and nearly all other tourniquets cause complete constriction of the limb, and, however useful as temporary measures, are exceedingly injurious when left on longer than two or three hours. They prevent the return of the venous blood and cause congestion, pain, and finally mortification. So serious have been the injuries produced through long-continued constriction of limbs by tourniquets, that some military surgeons have thought that more evil than good has resulted from their use. In the accounts of naval battles one often reads of the men unscrewing their tourniquets, and allowing themselves to bleed to death, rather than endure the pain of their wounds, the pain being caused, I believe, chiefly by the intense congestion produced by the constriction. After great land battles men are found who have had on tourniquets for twenty-four hours or longer, to the subsequent loss of limb or life.

Many attempts have been made, notably by the American army surgeons, to produce a tourniquet that would allow venous return—as do the aneurism tourniquets of Carte and

and there was closely connected with it a second and partially obliterated sac. This second sac was carefully separated from the first, and when examined appeared to be the sac of what had been a direct inguinal hernia. Having made a small incision into both of these sacs, and ascertained that their contents were reduced, I applied a catgut ligature around their necks as high up as possible.

I now prepared to act in the same way upon the neck of the femoral sac, but found that it had slipped up into the abdominal cavity. I could pass my finger readily by the wound into the femoral canal, down which the hernia came; and, while hesitating how best to secure the femoral sac, it occurred to me that the ligatured inguinal sacs might be drawn down into this canal and secured there, so as to plug it up and prevent the descent of the femoral hernia.

Accordingly, having passed my finger down through the wound into the femoral canal, I introduced through the inner aspect of the thigh, at a point a little internal and below the saphenous opening, a curved needle armed with carbolized silk, and pushed it through the tissues until its point reached my finger in the femoral canal, when it was brought out through the wound, together with one end of the silk, the other end being left protruding from the thigh. The needle with the silk attached was now run through and through the lower ends of the inguinal sacs, and, being carefully guarded by the finger, was re-introduced through the wound into the femoral canal, and along with the silk was brought out again on the thigh close to its original point of entrance. By pulling upon the two ends of the silk the inguinal sacs were drawn down into the femoral canal, and secured there by tying the ends of the silk together over a piece of indiarubber cord,

When the wound was stitched up, the patient was made to cough and move, but no protrusion of either hernia took place. The whole operation was performed with antiseptic precautions. No bad symptoms interfered with the good progress of the patient, and the stitches were removed on the tenth day. Two weeks after the operation the silk thread was cut, and came away quite easily, after a little traction had been made on it.

On the 12th of February, a truss, having two pads, one to press over the inguinal region, the other over the femoral region, was applied.

On the 14th of February, the patient rose from bed wearing the truss, and although I removed the truss when he was in the upright position, and tested him in various ways, no protrusion of the hernial tumours took place. From this date he continued to walk about the ward freely with the truss; and on the 26th of February he returned home, quite relieved from his miserable condition, and able to walk and move perfectly.

On the 3rd of May I had an opportunity of examining the patient, who had been following his employment since he returned home with perfect success. The inguinal protrusion no longer existed, and coughing and other movements caused no hernial descent in this region. There was a slight protrusion in the femoral region, which was, however, easily controlled by the pad of the truss.

Remarks.—I record a note of this case,—*First*, Because it is an example of a rare form of multiple herniæ affecting the same side. It is not very uncommon to meet with cases in which a hernia protrudes at more than one of the usual hernial sites, but the condition in which both a direct and inguinal hernia affect the same side is a rare one.

Lawrence writes—"Internal and external hernia may coexist on the same side; and these two may occur in conjunction with femoral hernia of the same side." He further states that—"Cases are recorded in which a common inguinal and a congenital hernia have existed together on the same side. The complication is probably very rare." The same author refers to a case examined by Sir A. Cooper, in which there were three protrusions in each inguinal region, and all of them internal to the epigastric artery.

The best, and I believe the only, detailed description of double inguinal hernia is that recorded and figured by Mr. John Chiene. The preparation taken from this case is now in the Edinburgh University Museum, and shows very distinctly a well-developed direct and oblique inguinal sac on the same side. In Mr. Chiene's case, the complicated nature of the hernia was not discovered until the parts had been dissected; and in my case, no peculiarity was observed in the inguinal hernia until the neck of the sacs had been exposed. The explanation of this probably is, that the one sac had become in great part obliterated, and therefore did not admit of the descent into it of any of the abdominal contents.

Although this double form of inguinal hernia is thought to be very rare, I think it not unlikely that it may really be more common, but have escaped notice during life, owing either to the smallness of one sac, the obliteration of one sac, or to one sac being pushed aside and obscured by the other.

The fact that such a double hernia may exist, is an important one to the practical surgeon, as it might be met with as a cause of an obscure intestinal obstruction, the presence of one unstrangulated hernia masking the existence of a second and strangulated one. Lawrence refers to a case in which a Mr. Wilmer operated on a congenital hernia, in which a common inguinal hernia also existed on the same side. The congenital one was operated upon, but the symptoms of strangulation con-

tinued, and the patient died. The second sac, containing gangrenous intestine, was found at the post-mortem examination.

Second, I report this case because it illustrates the success of an operation performed for the relief of a complicated case of reducible hernia, and because I am not aware that any previous attempt has been made by surgeons to relieve in this way, and at the same time, both an inguinal and a femoral hernia.

Although I am no great advocate for the so-called "radical" operations for the relief of reducible hernia, I believe that there are certain cases of reducible hernia, not easily controlled by the application of a truss, which may be much benefited by an operation, and placed in a condition which will allow a truss to be satisfactorily employed. The case reported certainly proves the value of such an operation.

A knowledge of the pathological fact that contraction or obliteration of the neck of a hernial sac is not uncommon, and the consideration that this condition is undoubtedly a cause of the spontaneous cure of reducible hernia, lead me to adopt ligature of the neck of the sac in my operation. As is well known, ligature or compression of the neck of a hernial sac is no new operation, but has been in various ways employed, by means of wire or silk ligatures, or by external pressure, and I therefore lay no claim to originality in this part of the operation.

The employment of prepared catgut as a suture in operations on hernial sacs was referred to by Mr. Lister in his well-known address on Surgery to the British Medical Association at Plymouth, in August 1871; and in connection with this subject he gave an account of two very interesting and successful cases of irreducible ventral and umbilical hernia, which he had treated by laying open the sac, separating adhesions, reducing the contents, and stitching together with catgut the margins of the openings through which the protrusions had come.

I have myself on several occasions successfully used catgut, and ligatured with it the neck of the sac, in cases of strangulated hernia, after dividing the constricting agent and reducing the contents, with the hope that this proceeding would lessen the risk of a return of the disease.

In connection with the ligature of the neck of a hernial sac, it may be objected to that the operation might be followed by strangulation and sloughing of the sac, and cases are on record in which these results have followed the employment of a silk ligature; but I am of opinion that the use of catgut, with precautions not to tie the ligature too tightly, will prevent any risk of such an occurrence.

The making use of an inguinal sac to plug the femoral canal,

as was done in this case, is, as far as I am aware, an original idea; but the experience of this case would rather tend to prove that such plugging is not so efficacious as ligature of the neck of the sac, for while the inguinal hernia remains cured, the femoral one already shows signs of returning.

Another little point of originality in my operation was the situation and direction of the incision. This incision is one which gives free access to the neck of the femoral sac, close to the general peritoneum, and it was found to be a most efficient one also for exposing the inguinal sacs at the point which seemed best for the application of the ligature.

Third, I would refer to this case as an example of successful antiseptic treatment.

There can, I think, be no doubt as to the value of the catgut ligature or suture in such an operation. A ligature or suture of this material is non-irritating, and may be left buried in the wound with the certainty that it will not require to be interfered with, but that it will become absorbed or otherwise disappear. One objection to the catgut as usually prepared is, that it may dissolve or disappear too soon; but Mr. Lister has now, I understand, a new method of preparing this substance, which allows it to remain in the tissues unaltered for almost any length of time. The use of this new catgut must therefore prove invaluable in this and other operations in which a more permanent ligature or suture is desired.

In conclusion, I have not called this case one of "radical cure," because experience has shown that the results of such operations are not often strictly radical. As I have already stated, this or similar means may be usefully employed to assist the application of mechanical support; and if such assistance should be required in any case of reducible hernia, I am inclined to advocate the ligature of the neck of the hernial sac with catgut in preference to the other methods usually employed.—*Edinburgh Medical Journal, June* 1876, *p.* 1087.

58.—CASE OF STRANGULATED INGUINAL HERNIA REDUCED BY A NOVEL METHOD.

By Dr. J. Holmes Joy, M.A., Tamworth.

Mrs. P., aged 60, has been "ruptured" for seven years, and has regularly worn a truss. On April 19th, while working in the factory, she strained herself, and felt that the truss had slipped. A few hours later, she was attacked with vomiting and severe pain in the abdomen, when she called to see her medical attendant, Mr. A. M. Sculthorpe, at his surgery. He

ordered an aperient and an enema, and desired her to go home to bed. At 2 p.m. (20th), he called to see her, and found the following symptoms present. She had constant vomiting, and complained of feeling faint and ill. The enema had been given, and had come away accompanied by but little fæcal matter, and the pain was not relieved. The taxis was now tried for upwards of an hour, but with no success; and, when he again saw her (about 10 p.m.), the pain and vomiting were present still, and the latter had become stercoraceous. The hernia was hard, as large as a walnut, and renewed and careful efforts to reduce it by the ordinary methods completely failed. I was now consulted as to the propriety of operation, as the symptoms had continued for thirty-six hours, and were becoming urgent. I suggested that, before resorting to an operation, trial should be made of cold applied by the ether-spray, and proposed, as an adjunct, if this should fail, inflation of the bowels by means of a common pair of bellows. After raising the patient's hips on two or three hard pillows, and leaving the shoulders low, the taxis was again tried unsuccessfully. Mr. Sculthorpe now applied the ether-spray, which quickly blanched the surface and emptied the part of blood. I now made trial of the taxis, and, after some time, a small portion of the sac's contents returned, but the greater part was quite immovable. The bellows' point was then well oiled and introduced *per anum*, and the application of the spray and taxis was renewed. The bellows (not being double-action) required to be withdrawn and filled again. On the fourth bellowsful being pumped slowly in, the bowels were much distended, and, by careful pressure and manipulation, the hernia was reduced. It was of the oblique variety, but had become (apparently) direct from age; and the size and hardness of the sac-contents rendered their return by pressure on the outer side, unaided by the traction from within, impossible. This traction was supplied by the inflation of the bowels, while at the same time the hernia was reduced in size by the extreme cold (which the ether-spray produced) depriving the parts of blood. The idea of the ether-spray for such a purpose is probably not new, and would naturally suggest itself to anyone. Inflation, I believe, is often used in France, and, several years ago, I remember reading of a case in which it was had recourse to in this country; but I have never seen the combination of the two, and, in the case I have detailed, I believe that either by itself would not have proved successful. This belief induces me to publish this brief notice, hoping that some other patients may possibly be saved a difficult and dangerous operation by these no less rational than simple means of treatment.—*British Medical Journal, May* 13, 1876, *p.* 595.

59.—STRANGULATED INGUINAL HERNIA: EMPLOYMENT OF THE ASPIRATOR.

By Dr. H. Blanc, Senior Surgeon to the Jamsetjee Jeejeebhoy Hospital, and Professor of Surgery in the Grant Medical College, Bombay.

Heerjebhai N., a Parsee, fifty-two years of age, but looking much older, weak and somewhat emaciated, was admitted into the clinical surgical ward on July 15th for strangulated inguinal hernia of the right side. The patient states that the hernia first made its appearance some five years ago; it was small and reducible, and he always wore a truss. On the morning of July 14th, whilst straining at stool, he felt a sudden sharp pain in the hernia, and, on rising, found that it had somewhat increased in size, and that he was unable to reduce it.

Condition on admission.—11 a.m.: The hernia, situated in the right groin, and extending to the upper part of the scrotum, is elongated, tense, and the seat of pain on pressure; the surrounding tissues are normal. The pulse is small and compressible, the face anxious, the eyes deep set, and the skin somewhat clammy. Temperature in axilla 99°. No motion since yesterday morning. The patient suffered from nausea and eructations yesterday evening, and during the night and to-day vomiting has been frequent; the vomited matters are at present watery and tinged with bile; they are not stercoraceous. Taxis has been tried this morning by a native practitioner, but according to the patient's account much force was not used; the manipulations provoked such excessive pain that he would not allow them to be continued, and was taken to the hospital at his own request. An ice-bag was placed over the tumour, and pieces of ice given him to suck; he was also ordered a belladonna suppository.—3 p.m.: The general and local conditions are very much the same as four hours before. Previous to administering chloroform, the patient was told that, should taxis fail, advantage would be taken of the anæsthetic about to be given to proceed at once to operate. The patient positively refused to submit to the operation of herniotomy, and before inhaling the chloroform made me promise that, should taxis fail, I would not perform the other operation. Under chloroform taxis was tried, but a minute of gentle manipulations showed the uselessness of the proceeding in this case. The hernial tumour felt very tense, giving above on percussion a slight resonant sound, and to the hand the feeling of a collection of fluid tightly compressed. Not being allowed to operate, and taking into consideration the character of the strangulated hernia, I decided on puncturing it. I introduced into the hernia the finest trocar of the aspirator, and with this instru-

ment withdrew about an ounce of slightly turbid, amber-yellow serum and a large quantity of gases. On withdrawing the canula, the hernia slipped back into the abdomen with the greatest ease. Ordered half a drachm of tincture of opium, a grain of opium every third hour until its effects were manifest, fomentations to the abdomen, ice to be sucked, and milk and broth diet.

July 16th. The patient passed a good night. The bowels have been moved twice. Complains of no pain in the abdomen; feels well. Temperature in axilla 98·5°; pulse 84, of a fair volume.

The case progressed most favourably; not a single bad symptom showed itself. The opium was discontinued the second day. Liquid diet alone was allowed for a few days, when more substantial food was permitted. On the 24th he was discharged.—*Lancet, Sept.* 2, 1876, *p.* 317.

60.—THE TREATMENT OF CLEFT PALATE BY THE APPLICATION OF STRONG ACID.

By Francis Mason, Esq., London.

I first produce a raw surface by carefully applying with a stick—*not a glass rod*—the acid. nitric. of sp. gr. 1·500, and in a few days, afterwards I use in the same way the acid. *nitric.* sp. gr. 1·420 (Ph. Brit.) about once or twice a week to the part, but especially to the fork of the cleft. I have had no bad symptom in any case, and although it is too early for me to lay before the profession the results of my experience, I believe there are numerous cases, in infants for example, and in *others* who dread an operation, in which this practice may be carried out; but of course it is not universally applicable. I may add that I have been induced to try this method from observing *the* singular success that follows the application of nitric acid in cases of cleft palate in which, after operation, the wound has partially opened. I have had recently, at St. Thomas's *Hospital*, two such cases, which, but for this method of treatment persistently employed, would have required a second operation.

Whilst I am on this subject perhaps you will allow me to say that Dieffenbach's operation (or that introduced into this country by Sir Wm. Fergusson) is a very easy proceeding if practised *in* the following manner, the plan I myself prefer:—Ether or chloroform having been administered, and the mouth kept open with a gag, I first pare the mucous membrane, if possible in *one* piece, to be sure that a continuous raw surface is produced. The anæsthetic effectually relaxes the muscles of the palate, so that they do not act spasmodically, and in paring the edge *there is* very slight hemorrhage. The bone is then divided; and, as in

this step the bleeding is frequently very free, not to say profuse, I thoroughly plug each side with a piece of dry lint, which instantly arrests the hemorrhage. I first tried this method some months ago, and the excellent effect of the practice was remarkably illustrated in a case in which I operated at St. Thomas's Hospital on Wednesday last. The remainder of the operation need not be referred to here. Instead, however, of dividing the muscles at the outset, which in many instances is attended by troublesome hemorrhage, I find that their action is sufficiently suspended during the healing process by carrying the knife for a short distance in the soft palate in a line with the incision made in the hard palate. If necessary, a few fibres of the palato-glossus and the palato-pharyngeus may also be divided in front and behind the tonsil.

I quite concur with Sir William Fergusson that in many cases the sides of the bony palate may be kept in apposition by lint alone, without the aid of sutures, and I now either leave the lint that has been used to arrest the hemorrhage, or replace it by another piece of more suitable size.

It appears to me that the difficulties of staphyloraphy arise chiefly from the hemorrhage which hampers the surgeon. Make the operation comparatively bloodless—as it is if performed in the manner above described,—and it is one of the simplest in surgery.—*Lancet, July* 29, 1876, *p.* 170.

ORGANS OF URINE AND GENERATION.

61.—ON PERINEAL SECTION, AS PERFORMED AT LEEDS.

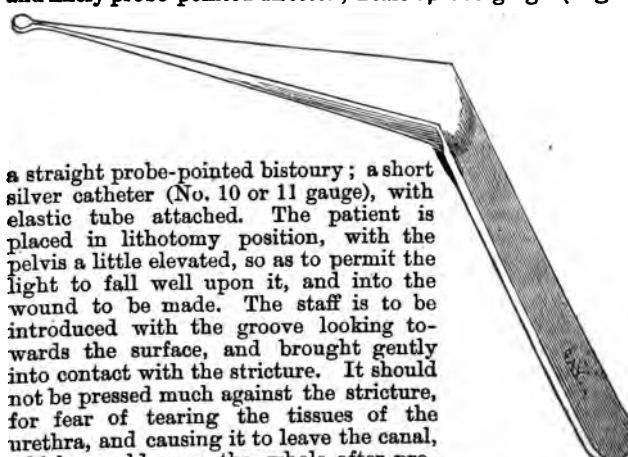
By C. G. WHEELHOUSE, Esq., Senior Surgeon to the Infirmary.

Notwithstanding the length of time that has elapsed since, in 1869-70, I brought before the profession, in the columns of the British Medical Journal, my method of finding my way, in cases of impermeable stricture from the perineum, *through* the stricture and into the bladder, the subject seems to have received so little notice, that I deem it advisable once more, after several years of successful employment of the operation, to revert to the subject; and I am induced to do this the more willingly, because I find that in even the most recent and most voluminous works on surgery, the subject is dismissed with very few words, and the old hap-hazard measure of reaching the bladder without any guide—it *may be through*, or it *may be altogether wide of the stricture*—is still recommended and described as the one in ordinary use. Over this method, the procedure which I adopt has at least the advantage of greatly increased

precision; it renders an operation, confessedly hitherto one of the most difficult in surgery, a comparatively easy one, and one which, in my hands, and in those of my colleagues, has given results infinitely more favourable both in immediate and ultimate effect upon our cases than any we had ever seen before its introduction. The instruments required are as follows: lithotomy bandages; a special staff, fully grooved through the greater part, but not through the whole, of its extent, the last half inch of the groove being "stopped," and terminating in a rounded button-like end (Fig. 1); an ordinary scalpel;

Fig. 1.—Grooved Staff, with Button-like End.

two pairs of straight-bladed forceps, nipped at the points; ordinary artery forceps and ligatures; sponge; a well grooved and finely probe-pointed director; Teale's probe-gorget (Fig. 2);



a straight probe-pointed bistoury; a short silver catheter (No. 10 or 11 gauge), with elastic tube attached. The patient is placed in lithotomy position, with the pelvis a little elevated, so as to permit the light to fall well upon it, and into the wound to be made. The staff is to be introduced with the groove looking towards the surface, and brought gently into contact with the stricture. It should not be pressed much against the stricture, for fear of tearing the tissues of the urethra, and causing it to leave the canal, which would mar the whole after-proceedings, which depend upon the urethra being opened *a quarter of an inch in front of the stricture*. Whilst an assistant holds the staff in this position, an incision is made into the perineum, extending from opposite the point of reflection of the superficial perineal fascia to the outer edge of the sphincter ani. The tissues of the perineum are to be steadily divided until the urethra is reached. This is now to be opened *in the groove* of the staff, *not upon its point*, so as certainly to secure a quarter of an

inch of healthy tube immediately in front of the stricture. As soon as the urethra is opened, and the groove in the staff fully exposed, the edges of the healthy urethra are to be seized on each side by the straight-bladed nibbed forceps, and held apart. The staff is then to be gently withdrawn, until the button-point appears in the wound. It is then to be turned round, so that the groove may look to the pubes, and the button may be hooked into the upper angle of the opened urethra, which is then held stretched open at three points thus (Fig. 3), and the

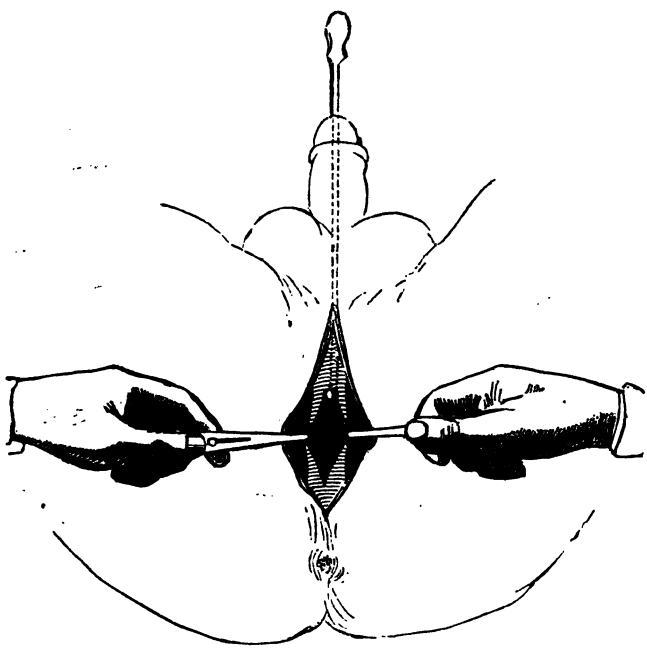


Fig. 3.—Staff introduced.

operator looks into it immediately in front of the stricture. Whilst thus held open, the probe-pointed director is inserted into the urethra; and the operator, if he cannot see the opening of the stricture, which is often possible, generally succeeds in very quickly finding, it and passes the point onwards *through* the stricture towards the bladder. The stricture is sometimes hidden amongst a crop of granulations or warty growths, in

the midst of which the probe-point easily finds the true passage. This director having been passed on into the bladder (its entrance into which is clearly demonstrated by the freedom of its movements), its groove is turned *downwards*, the whole length of the stricture is carefully and deliberately divided on its under surface, and the passage is thus cleared. The director is still held in the same position, and the straight probe-pointed

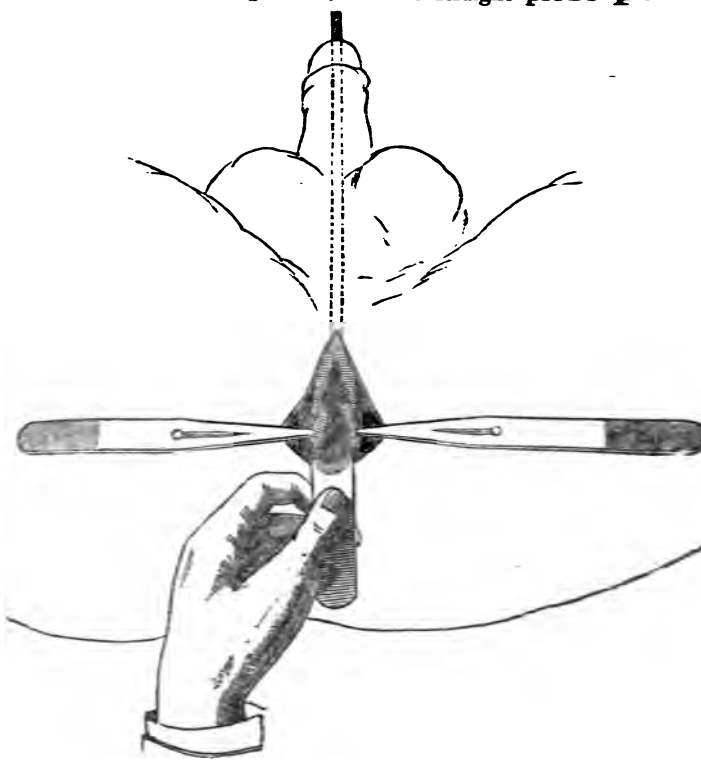


Fig. 4.

bistoury is run along the groove, to insure complete division of all bands or other obstructions. These being thoroughly cleared, the old difficulty of directing the point of a catheter through the divided stricture and onwards into the bladder is to be

overcome. To effect this, the point of the probe-gorget is introduced into the groove in the director, and, guided by it, is passed onwards into the bladder, dilating the divided stricture, and forming a metallic floor, along which the point of the catheter cannot fail to pass securely into the bladder. The entry of the gorget into the latter viscus is signalised by an immediate gush of urine along it.

The short catheter is now passed from the meatus down into the wound; is made to pass once or twice through the divided urethra, where it can be seen in the wound, to render certain the fact that no obstructing bands have been left undivided; and is then, guided by the probe-dilator, passed easily and certainly along the posterior part of the urethra into the bladder thus (Fig. 4.).

The gorget is now withdrawn; the catheter fastened in the urethra, and allowed to remain for three or four days; the elastic tube conveying the urine away to a vessel under or by the side of the bed.

After three or four days, the catheter is removed, and is then passed daily, or every second or third day, according to circumstances, until the wound in the perineum is healed; and after the parts have become consolidated, it requires, of course, to be passed still from time to time to prevent recontraction.—*British Medical Journal, June* 24, 1876, *p.* 779.

62.—STRICTURE—AN IMPROVED METHOD OF PERFORMING THE "BOUTONNIERE" OPERATION.

By W. F. Teevan, Esq., B.A., Surgeon to the West London and St. Peter's Hospitals; late Lecturer on Anatomy at the Westminster Hospital.

The nomenclature of the operations performed on the urethra is somewhat confusing. Take, for instance, the name "perineal section": by it the student at Edinburgh understands an operation which is different from that which the student at Leeds sees practised; and, if an English, Irish, or Scotch student were asked whether an internal urethotomy practised in the bulbous region of the canal were perineal section, he would probably reply in the negative, although an affirmative answer ought to be given to the question. It would be well, therefore, if all the following terms were abolished—*i. e.*, perineal section, perineal urethrotomy, external urethrotomy, external perineal urethrotomy—and the older and more correct names of "boutonnière" and "boutonnière sur conducteur" were employed. The French terms have this great advantage, that surgeons all the world over know exactly what is meant by them. By "boutonnière" is understood an operation for the

division of a stricture through which no guide can be introduced when the operation is commenced. "Boutonnière sur conducteur" explains itself, and is the division of a stricture upon a conductor passed through it before the operation was begun.

The "boutonnière" is one of the oldest, most valuable, and difficult operations in surgery. For the relief of an impassable stricture, or retention therefrom, it is unsurpassed, as it remedies the cause and effect at one and the same time. It has been greatly praised and considerably disparaged. In recent times, it owes much for its preservation in France to Sédillot, in America to Gouley, and in this country to Teale and Wheelhouse. In Leeds, the operation is performed systematically, frequently; and I should say that in that town it is done more often in one year than in all the London hospitals put together during the same period. The journals may be searched for years together, and but little will be found regarding this most interesting and useful procedure.

If the various surgical works be examined, it will be found that the operation may be divided into four different steps: 1. Opening the urethra at, above, or below the stricture: 2. Finding the entrance to the stricture, and passing a grooved probe or bougie through it. There are, of course, cases where the surgeon fails to find the entrance, and is obliged to dissect on bit by bit along what he supposes to be the course of the canal till he arrives at the pervious urethra beyond. 3. Division of the stricture on the probe-pointed director or whalebone bougie. 4. Introduction of the catheter into the bladder. As a rule, most surgeons commence the operation from above downwards; but Mr. Coulson and others have reversed the step. I extract the following description of the method as pursued by Mr. Coulson from the French, as there is an impression in this country that French surgeons know but little of the opinions or practices of others.

Procédé de M. Coulson.—"Ce chirurgien porte un cathéter cannelé jusqu'au rétrecissement, il incise le périnée, et il fait la boutonnière derrière le rétrécissement: par cette ouverture, il introduit un stylet cannelé dans le stricture, jusqu'à ce qu'il soit presque en contact avec le cathéter, appuyé sur la face antérieure de l'obstacle; il incise ensuite sur le stylet cannelé toute l'épaisseur des tissus de la portion de l'urètre rétrécie; il fait ainsi cesser la rétention en meme temps qu'il opère le rétrécissement." (Traité des Maladies des Voies Urinaires, par le Docteur Ch. Phillips, p. 180.)

The unfrequency of the performance of the operation is, a think, due to two causes: firstly, the difficulty of finding the entrance to the stricture and introducing a probe hrough it; secondly, even when the surgeon has succeeded in passing a

probe, his state of uncertainty as to where it has gone, and his natural dislike to cut in the dark. There must also be added those cases in which it is impossible to pass any guide, and where the surgeon is left to work a way and grope into the bladder as he best can, and may possibly utterly fail to reach the pervious urethra beyond the stricture. Cases are on record in which experienced surgeons have failed to accomplish the operation, and the patient has been taken away from the operating-table with the stricture unrelieved. Lastly, the surgeon may apparently succeed, and find afterwards that he has only cut open a false passage or a fistula, leaving the strictured urethra untouched. When I had performed the operation several times, I found there were two separate defects to be remedied: firstly, the difficulty of finding the entrance into the stricture; secondly, the uncertainty as to the real position of the probe when apparently introduced into the bladder. The first defect arises from two separate causes. *a*. The probe may fail to enter a stricture because it is too large. A ferret will wriggle into a rabbit-hole when a dog cannot, simply because it is much smaller; and a probe will sometimes fail to enter a stricture when a fine whalebone or filiform bougie will slip in with ease, because the metal director is too big. *b*. The probe being constructed of unyielding metal, it may utterly fail to follow the tortuous passage of the stricture. If a ferret suffered from an ankylosis of the vertebral column, he might possibly succeed in getting into the rabbit-hole; but his progress would soon be arrested by his inability to adapt his body to the windings of the passage. I have, therefore, entirely abandoned the use of metal probes, and taken to whalebone and filiform bougies, as advocated by Dr. Gouley of New York; and I think it will be found that they will overcome the difficulties above alluded to, and prove tractable and efficient instruments in the hands of surgeons.

The second defect is more important. When the probe or whalebone bougie has been passed, the question to be asked is, Whither has it gone? If it could be moved about freely in all directions, were in the median line, and were not in the rectum, most surgeons probably would feel satisfied, and say that it must be in the bladder. But it has occurred to very experienced operators to be deceived on this point; and, when they thought that they had introduced the probe into the bladder, they had really passed it into the rectum, beyond the reach of the finger, or into a sac between the rectum and bladder, or into a false passage. It has been my object to remedy this defect, *and to convert an uncertain procedure into one in which the surgeon is able to determine absolutely whether his guide be in the bladder or not before he begins to cut*, so that he will be saved the mortification of being foiled in the execution of the operation.

I will now briefly enumerate the various steps of the operation. The patient, having had the rectum emptied and the perineum shaved, is to be put into the lithotomy position, and there secured with Pritchard's anklets and wristlets. A straight staff with a groove in it is now to be passed down to the face of the stricture. I know of none better than Mr. Wheelhouse's, in which the groove stops short half an inch from the end of the staff, which is tipped with a button, so that, after it has served as a guide for the surgeon to open the urethra, it can be turned round to hook up the apex of the wound with its button. The urethra is "to be opened *in the groove of the staff, not* upon its point" (Wheelhouse). There is a great advantage gained in the opening just above the stricture, rather than on a level with it; for the *cul de sac* containing the mouth of the stricture is preserved, and not slit up as it would be were the incision made at the point of the stricture. The edges of the wound are to be kept apart with sharp-pointed hooks, or two pairs of artery-forceps with nibbed points, as used by Mr. Wheelhouse; or two loops of thread may be passed through the edges, as introduced by the late Mr. Avery, and highly extolled by Dr. Gouley of New York. I have always used hooks, and found them answer every purpose. Now comes the most important step but one of the operation—searching for and finding the entrance into the stricture, and passing the instrument through it.* English surgeons use metal probes, but I prefer the bougies as employed by Dr. Gouley. My two favourites are depicted in the woodcut at A C. A B is a very fine whalebone bougie, not much bigger than a horsehair, and having each end tipped with an olive. It is an exquisitely made bougie, and was sent to me from Augusta, Georgia, by Dr. Coleman. The bougies for this operation must for the present be procured from France or America, as the English ones which I have seen are not sufficiently fine and smooth for the purpose, and all lack properly made olives at their ends. Having taken the bougie represented, I impart to one extremity a beak, such as is depicted at B, and with it I search for the entrance into the stricture. If I fail, I try with the other end of the bougie; and, if I do not succeed, I take one of Leroy d'Etiolles' "bougies tortillées," C. I may say that I have always managed to pass one or other of these bougies through the stricture into the bladder. It sometimes happens that there are several false passages or fistulæ. Each of the openings ought to be filled with a bougie, which is to be left there, and

* The comparative lengths of the different instruments represented in the woodcut are not, relatively, quite correct. The bougies A C, and the tube D E, are each ten inches long. The slit F is two inches long, and terminates two inches from the vesical end E. The vesical half of the catheter, G H, is five inches in length, and the urethral half, I K, is nine inches long.

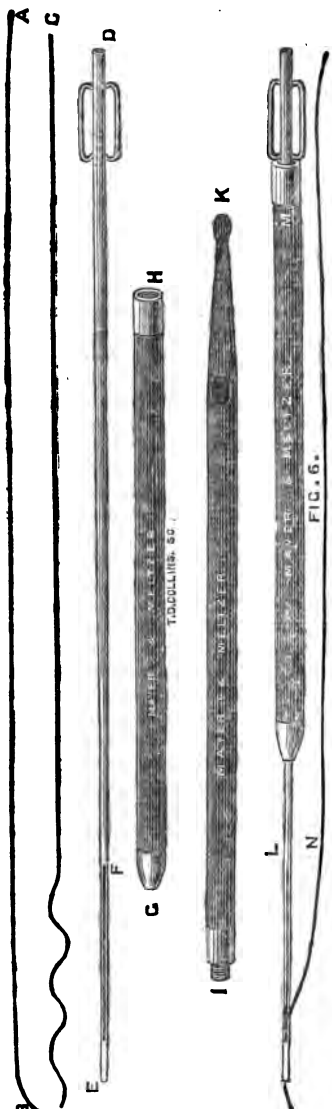


FIG. 6.

another and another passed till at last one vanishes, apparently, into the bladder. This plan was introduced by Auguste Mercier, and is adopted by Gouley, and is a practical exposition of the method of arriving at a result by "the process of exclusion."

I now come to the very pith and kernel of the operation. I think I have passed the bougie into the bladder, and I ask myself the all-important question, Whither has it gone? Before commencing to divide the stricture, I proceed to prove the position of the bougie, and to demonstrate conclusively whether it be in the bladder or not by sliding over and along the bougie the fine silver tube D E, which is open at both ends, has a slit F for the tenotome to run in, and is fitted with the vesical half G H of the elastic catheter; so that, when the tube is entering the bladder, we have the combination depicted in Fig. 6, where the silver tube L, carrying the vesical half M of the elastic catheter, is seen gliding over and along the bougie N, which is now to be withdrawn, when urine will flow out of the metal tube if it be really in the bladder. If urine come out, the stricture is to be divided by sliding a probe-pointed tenotome along the slit in the tube, which is to be held in such a manner that the slit, which serves as a groove, shall look upwards. The deep part of the urethra is thus divided subcutaneously with-

out enlarging the original wound. The vesical half M of the elastic catheter is now to be gently pushed along the tube L till it is fairly in the bladder. If its progress be arrested at any point, the tenotome must be reintroduced, and any opposing tissue divided. The vesical half of the catheter having been passed into the bladder, the metal tube is withdrawn, and the end I of the urethral half I K of the elastic catheter is to be screwed into its fellow-half at H, so as to make one continuous catheter. The next thing to be done is to pass the olive end K upwards from the apex of the wound till it emerges at the meatus externus. This is usually easy to do; but, if there be any trouble in doing it, an assistant can pass a large olivary catheter down the penis till the point of the instrument appears in the wound. The surgeon now catches hold of the point, and, having cut off three inches of the protruded catheter, he inserts into its cavity the end of the elastic catheter, K. The assistant, still holding the catheter he passed downwards, now draws it upwards, and thus brings up with it the other catheter, which was inserted into it by the surgeon. The catheters are now unlinked, and the one in the bladder can be retained or not as the operator may fancy. I look upon the retention of a catheter as a relic of a surgical age now past; for Dr. Gouley has, by the narration of a number of facts, conclusively demonstrated that the retention of a catheter after operation is, to say the least, perfectly unnecessary.

The advantages of the operation as above described may be summed up as follows. 1. The greater chance of finding the entrance to the stricture with a fine olive-tipped bougie, and, when found, of passing it through the stricture, than with the stiff metal probe, which is larger. 2. Demonstrating that the bougie is really in the bladder by sliding a fine silver tube over it and drawing off the water. This is really *the point* of the operation, for it enables the surgeon to divide the stricture with certainty, and spares him the mortification of laying open a false passage. 3. The metal tube serves as a guide over which the elastic catheter can be passed into the bladder. 4. Diminishing the risk of the operation by dividing the stricture subcutaneously, instead of enlarging and extending the original wound.

I consider the "boutonnière" the right and proper operation to perform for the relief of impassable stricture, after the surgeon has exhausted all ordinary means to pass a catheter. If retention of urine from impassable stricture set in, then the operation is specially indicated, for by it the cause and effect are treated at one and the same time.—*British Medical Journal*, *Sept.* 30, 1876, *p.* 422.

63.—ON THE DETECTION OF STONE IN THE BLADDER.

By W. F. TEEVAN, Esq., B.A., Surgeon to the West London Hospital.

The detection of stone in the bladder is a subject of lasting interest and importance, and as from time to time errors have occurred in connection with it, I propose to inquire into the causes that gave rise to them. The matter may be divided into two heads. (1) The surgeon failing to find a stone when there is one. (2) The surgeon operating for stone when there is none. The former mistake has happened more frequently than the latter. There is probably no surgeon of much experience who could say that he had never missed a stone; and in Mr. Coulson's classical work "On Diseases of the Bladder" there are numerous instances recorded of the non-detection of a calculus. When we consider that on several occasions stones as large as mandarins escaped the search of Civiale, the greatest lithotritist, probably that the world has ever seen, and were grasped by Mercier's hands, we can hardly wonder at the mistakes which have occurred. I know that I have failed to detect a calculus, whilst on the other hand, I have discovered stones which had slipped through the hands of other surgeons. It may, indeed, be said that not only will one surgeon on a given day find a calculus which had not been discovered by another, but that he will in a given case find the stone one day and fail to discover it the next. The fact that calculi from time to time escape detection is due to two causes. (1) The employment of imperfect instruments for sounding. (2) The stone being encysted or covered by a prostatic valve or lobe. Various instruments have been devised for finding a calculus, but for the present the surgeon relies on the sound. Not so many years ago the sounds employed in this country were ill-adapted for the intended purpose, but recently more appropriately-shaped ones have been used. It can readily be imagined that small stones are sometimes very difficult to detect, but it is not so easy to account for the non-detection of large stones, and that, too, by surgeons of great experience. What is the reason that a stone escapes discovery sometimes, even when sought for by a skilful hand? It is simply *because only a part of the bladder was examined*, so that it may be said that the stone is missed simply because the place where it is lying is not searched. If a stone be present and be not encysted or covered by a prostatic valve or lobe, it will be discovered if properly looked for; but this implies an examination of every part of the bladder, or, in other words, the employment of an instrument which can search every nook and cranny, and as the sounds in use cannot, as a rule, accomplish that, a stone often escapes detection. When a

patient suffers from calculus the bladder is usually irritable, and holds but little urine, and if the surgeon try to remedy the defect by an injection he will in all probability be disappointed at seeing the water escape either before or during examination. Hence, therefore, the cavity in which the search is to take place is of very limited dimensions, and will not permit the movement of a large beaked sound in it. It may be laid down that the shorter the beak of the instrument the greater the range and freedom of movement that will be permitted to it. The burly captain of a small yacht may be scarcely able to move about in the contracted cabin, whilst his little son will run about with ease. Let me apply this to the case of sounding. A large-beaked sound may, through its great size, fail to detect a stone which could at once be discovered by a small beaked one.

It may be laid down that the nearer the angle formed by the beak and shaft approaches a right angle, the more fitted the sound will be to carry out the indications required. The worst sound is one which is nearly straight, and the best one is that which has a right angle; but inasmuch as a sound with a right angle could not be introduced into the bladder, Mercier has fixed the beak of his sound to the shaft at an angle which nearly approaches it. He has at the same time greatly shortened the beak, so that of all sounds extant this one permits the greatest amount of movement in the bladder. The relative merits of sounds can easily be ascertained by employing them on the same patient. For instance, if Mercier's sound be used after another one, the patient will say that it annoys him less, and the surgeon will find that he will be able to reverse its beak, and to rotate it in all directions without hurting the patient, for the movements of the short beak will not be arrested by the fasciculi of the bladder; the escape of a drop of blood will be an event of very rare occurrence. If, on the other hand, a sound with a long beak be employed it will hurt the patient, bring blood perhaps, and its movements be arrested by the fasciculi. It is of the greatest moment to be able to rotate the sound freely in all directions, especially in the region of the neck of the bladder, and experience will teach that the short-beaked sound of Mercier is the only one by which a proper examination of the neck of the bladder can be carried out. All sounds ought to have the tips of their beaks well rounded and made very blunt, so that if the third lobe of the prostate be enlarged they will not press into it when passing into the bladder. If a sound be tapered or olive-tipped, it will hurt the patient and bring blood. To those not accustomed to use a "coudée" sound, it may seem difficult to pass, but it is not so, and the surgeon will rarely fail to introduce it; whilst, on the other hand, he will succeed in passing it when unable to get in other sounds.

It requires to be introduced much in the same way as a lithotrite, taking care that the act of depressing the handle be delayed in order to allow the sound to proceed as far as it can whilst in the vertical position. It may be laid down that all sounds ought to be made with slender shafts, for the movements of a sound with a thick shaft in the urethra are very irritating to the part, and annoying to the patient. The evil may be reduced to a minimum by having the shaft made not larger than a *No. 6, English* size.

The advantages of Mercier's sound over all others may be thus summed up. 1. It avoids false passages, as it presents to them, not its point, as other sounds do, but the heel of its beak. 2. It can be introduced when the surgeon has failed with other sounds. In certain cases of enlargement of the third lobe of the prostate ordinary sounds cannot be passed, whilst Mercier's sound will rarely fail. 3. It annoys the patient less, as it does not rub sharply against the fasciculi. 4. It can be made to examine a larger surface of the bladder than any other sound, as its short beak permits it a greater freedom of movement. 5. *It is the only* instrument which can diagnose accurately the *existence of* tumours of the bladder, prostatic valves, &c.

One of the causes of the non-detection of small calculi is, I think, to be found in the fact that, as a rule, they lie close to the neck of the bladder; so that when the sound is introduced it passes by the *stone* and makes for the fundus, and as the surgeon felt *nothing* on entering the bladder, he concluded there was *nothing at that* spot. I have usually found small calculi at the left side of the neck of the bladder. Mr. Coulson has a "lex non scripta" to the effect—"Behind an enlarged prostate suspect a stone." The experience of every surgeon would, I think, go to prove that most adults who have suffered from stone have also had enlarged prostates. When a small stone is lying quietly behind an enlarged gland it can be readily imagined how easy it is to miss it, especially with the sounds usually employed in this country, and hence it is always well to raise the patient's buttocks on a good stiff bolster, so as to make the fundus the lowest portion and force a stone to roll into it from the neck. The introduction of the left forefinger into the rectum to tilt up the bladder, the depression of the hypogastric region with the *left hand*, and the withdrawal of the urine through the sound, are valuable and indispensable aids when searching for stone.

I now come to the second portion of my subject—operating *for stone when none exists*. This accident has occurred more frequently than may perhaps be suspected, and has arisen this *way: No physician* can diagnose whether a given sound heard in the heart be abnormal or normal, unless he know what are the *sounds that can be* heard in the normal state. Neither can a

patient suffers from calculus the bladder is usually irritable, and holds but little urine, and if the surgeon try to remedy the defect by an injection he will in all probability be disappointed at seeing the water escape either before or during examination. Hence, therefore, the cavity in which the search is to take place is of very limited dimensions, and will not permit the movement of a large beaked sound in it. It may be laid down that the shorter the beak of the instrument the greater the range and freedom of movement that will be permitted to it. The burly captain of a small yacht may be scarcely able to move about in the contracted cabin, whilst his little son will run about with ease. Let me apply this to the case of sounding. A large-beaked sound may, through its great size, fail to detect a stone which could at once be discovered by a small beaked one.

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It requires to be introduced much in the same way as a lithotrite, taking care that the act of depressing the handle be delayed in order to allow the sound to proceed as far as it can whilst in the vertical position. It may be laid down that all sounds ought to be made with slender shafts, for the movements of a sound with a thick shaft in the urethra are very irritating to the part, and annoying to the patient. The evil may be reduced to a minimum by having the shaft made not larger than a No. 6, English size.

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I now come to the second portion of my subject—operating for stone when none exists. This accident has occurred more frequently than may perhaps be suspected, and has arisen this way: No physician can diagnose whether a given sound heard in the heart be abnormal or normal, unless he know what are the sounds that can be heard in the normal state. Neither can a

surgeon interpret what he may hear in the bladder unless he be acquainted with the sounds that can be evoked from a healthy organ. Now I have found by examining dead bodies, that usually three bony points can be made to give forth sounds—*i.e.*, the secrum, the spine of the left ischium, and the spine of the right ischium. These bony points can usually be struck, but not always, and they emit dull sounds which may be mistaken as proceeding from calculi. I imagine they have misled surgeons in this manner. When the surgeon has passed a sound into the bladder, struck something, and heard a something, he concluded that as the sound was given forth in the bladder it must have proceeded from a foreign body in that viscus. The fact was that the thing struck was *outside the bladder and not in it.* The sound did not originate in the bladder, but was transmitted through its walls. Then again the shaking of the links in the surgeon's cuff may deceive. I have, on more occasions than one, when sounding for stone, heard a bystander say, "There is a stone, I hear it." I have then taken out my links and asked him if he still heard the sound, and he has replied, "No." Even the click produced by shaking a well-oiled sound in the urethra may mislead. The hypertrophied fasciculi of the bladder may be covered with a phosphatic deposit, and transmit a sensation of there being a something in the bladder; or the third lobe of the prostate may be enlarged, pedunculated, covered with earthy matter, and when struck give forth a sound. Lastly, a fungus, a tumour, blood-clot, or hydatids must be added to the list of things capable of leading a surgeon astray.

Now one means of clearing up any doubt as to what a certain sound may proceed from is to make the patient change his position. Bony points will still maintain their relative situations, but a stone usually rolls about. But if a surgeon use a lithotrite before operating—and no surgeon ought to operate without first of all examining the bladder of an adult with that instrument—mistakes will be rendered most impossible. A lithotrite will not clutch the sacrum, or any other bony point, but it will burst blood-clots and hydatids, and enable the surgeon to say whether a given body in its jaws be a stone or only a pedunculated tumour.—*Lancet, April* 29, 1876, *p.* 633.

64.—*ON* A SIMPLE MODE OF EXTRACTING CALCULI ARRESTED IN THE URETHRA.

By Dr. J. C. OGILVIE WILL, Assistant-Surgeon to the Aberdeen Royal Infirmary.

[*It is no easy* matter to extract a calculus arrested in the urethra, and, as the occurrence is sudden and the symptoms

often urgent, immediate action is necessary. The mode proposed by Dr. Will is illustrated by the following case.]

In June, 1874, S. W. consulted me on account of the difficulty he experienced in passing water. He had observed that his stream was gradually diminishing in size during some months before, but his particular attention was directed to it on the previous day, on finding that he was unable to pass urine when the desire was strong. After a short time, however, he succeeded in getting partial relief, the water running off in driblets, and the act was attended by great pain at one part of the penile portion of the urethra, where he felt that there was something blocking up the passage. On external examination a localised hardness was distinctly perceptible a little in front of the triangular ligament, and a hard body could be readily felt behind a hard cartilaginous ring. After attempting the introduction of larger-sizedinstruments, I succeeded in passing a No. 5 catheter into the bladder. A grating sensation was communicated to the instrument as it passed the obstacle, and the presence of a calculus arrested by a stricture diagnosed. The diagnosis was easy, the removal of the calculus extremely difficult, for no forceps in my possession would pass through so narrow an obstruction, as the common urethral forceps, and the instruments suggested by Leroy d'Etiolles, Reliquet, and Civiale, are not so constructed as to be of use in such a contingency. I was unwilling to cut down on the calculus, as in all probability a fistulous opening would have been left, which could not have readily healed; and as the patient was in a very weakly state of health, internal urethrotomy would not have been advisable. The idea of snaring the calculus by a loop of wire then occurred to me, and I at once determined to give it a trial. Accordingly I passed a loop of tolerably thick silver wire through the stricture behind the calculus, which, after a little manipulation, it caught, but lost its hold more than once; but at length I had the satisfaction of pulling out a thin plate of calcareous matter, much to the delight of the patient, whose expressions of gratitude were unbounded.

In this case a simple loop of wire succeeded when a complicated apparatus, however useful in ordinary cases of bodies arrested within the urethra, could not be used. Though it may appear rather a difficult matter to encircle a urethral calculus with a loop of wire, it is not so, and if we remember that the urethra is not a tube through which any body can be easily pushed along, but a closed valve or long chink, whose sides lie in close contact, the reason of the simplicity of this manœuvre will be readily understood. The difficulty is not in the snaring, but in the retaining of the hold, the loop being apt to slip, especially if the foreign body be a very small one. To over-

come this difficulty I have had a slender silver canula constructed, which is to be used with the wire loop. The latter should first be passed well beyond the calculus, and the canula slipped over the projecting ends of the wire, and its point brought to bear against the stone, by which it will be steadied, then by making slight traction on the free ends of the wire, the loop will be brought against the calculus, which will thus be securely fixed between the wire and the mouth of the canula. The ends of the wire may then be twisted round the rings with which the canula is provided at its proximal extremity, and the apparatus withdrawn. By this mode of procedure, the foreign body being tightly fixed between the loop and the mouth of the tube, it cannot possibly slip out, and its extraction can be accomplished with the greatest ease. Although the canula I refer to is the most suitable instrument for the purpose, an efficient enough one can be extemporised by cutting a bit out of an old catheter; and in some cases the loop of wire will of itself be all-sufficient, as it was in the case just mentioned, and also in that of a child who had a calculus arrested at the bulb, and where a loop of wire was passed behind it, and slight pressure applied to the perineum to steady it, then by a jerking movement the calculus was brought well within the penile portion of the urethra, and by reapplying the wire and again jerking it was thrown out.

The chief recommendations of the mode I propose are its simplicity and certainty, also its almost universal applicability in cases of arrested urethral calculus, or any similarly shaped body whose extraction is called for. The canula I possess was constructed for me by Mr. Young, instrument-maker, Edinburgh, and is admirably suited for the purpose.—*Lancet, May* 13, 1876, *p.* 703.

65.—AN EASY METHOD OF EXTRACTING A BROKEN CATHETER FROM THE URETHRA.

By Dr. CHRISTOPHER YOUNG, Yarm.

On visiting a patient about eighty years of age, I found he had retention of urine, caused by the catheter he had been accustomed to use having broken in his urethra in the act of introducing it. On examining the other portion, I found it to be a No. 8 silver catheter, about nine inches in length. The point of breakage was beyond the beginning of the curve; it was darkened in colour by chemical action, was broken obliquely, and presented two thin sharp-pointed spicula three-eighths of an inch long. On further inquiry, I found that the catheter had been repaired by a watchmaker a few weeks before. On external examination, the urethra was tender; and the broken

portion lay about seven inches from the meatus, and was moveable only in the direction of the bladder. I then took the eyes off a No. 11 catheter, passed it down to and over about an inch of the broken end, when, on making an angle with No. 11, No. 8 became locked, and was easily withdrawn. This illustration of a simple method of extraction may be worthy of remembrance, and be employed with modification in the extraction of other foreign bodies. The size of the tube to be used will only be limited by the size of the meatus. On fixing the object to be removed by external pressure, the tube slides easily over it, and may, by manipulation, be extracted without any wounding of the mucous membrane, and without having recourse to an operation.—*British Medical Journal, June* 3, 1876, *p.* 682.

66.—NEW METHOD OF CURING PHYMOSIS.

By Dr. G. DE GORREQUER GRIFFITH, Senior Physician to the Hospital for Women and Children, Vincent Square.

Some years ago, a patient came to me with a very slight stricture of the foreskin. I did not then perform any of the usual operations, but dilated the aperture in the prepuce by means of a forceps something like the ordinary uterine dressing forceps. The pain was very trifling.

My next patient was a young schoolmaster who had contracted gonorrhœa or balanitis, or both together, I was unable to decide which, as the preputial orifice was so small that I could not see that of the urethra for some time, and till I had subdued the inflammation. Then through the exceedingly narrow opening in the foreskin I got a glimpse of the entrance of the urethra. It was of importance to him to get well quickly as he was about to be married, but he had a very great horror of the knife. I cured his more urgent affection, and then proceeded to open up the os preputii; not as I had done before from the outside inwardly, but from within outwards. Making the patient stand in front of me, I grasped the penis with the fingers of both hands, and partly by retracting the foreskin, partly by projecting forwards the glans penis, I commenced this wedge-like dilatation, and soon had the satisfaction of seeing an area of surface around the mouth of the urethra. This procedure I repeated every other day, and, in a fortnight, the phymosis was quite cured, so as not to be likely to return. He married, and has become the father of two children; and, when I recently examined him, there was not even any approach to contraction—he has, in fact, remained perfectly cured. This patient had never before had any part of the glans uncovered except the very mouth of the urethra.

The third case came under my notice in July, 1876. The young man, eighteen years old, had never been able to get the skin back at all. He had just contracted a very severe discharge, attended with a good deal of inflammation and swelling. Having cured him of these, I then treated him for the phymosis, which was quite as light as in the second case I have recorded, and, at the fourth sitting, I had the pleasure of being able to uncover the entire glans penis. I had adopted the plan of making him inject some oil under the foreskin on each occasion previous to his coming to consult me. With this patient I used the recumbent posture, because the pain was more severe than in the former cases, but then the treatment was much more rapid. Under chloroform the dilatation might be even more rapid—effected, perhaps, in one, or at most two sittings, especially if we did not mind splitting the mucous lining of the prepuce; but I prefer producing no rent or crack, but simple dilatation.—*British Medical Journal, Oct.* 7, 1876, *p.* 464.

67.—ON VESICO-VAGINAL FISTULA.

By Dr. NATHAN BOZEMAN, New York.

In the month of November last, Prof. Dolbeau submitted to me for treatment at the Hôpital Beaujon three women with four urinary fistulæ, which he said were incurable by the methods ordinarily employed in France.

Case 1 presented a somewhat elliptical opening extending from the middle of the urethra to the cervix uteri, measuring longitudinally about five centimetres, and transversely between two and three; broad cicatricial bands extended across the rectal wall, which effectually prevented movement of the uterus downwards. This case I did not treat.

Case 2 had a small transverse urethro-vaginal fistula near the bladder, and at the same height a cicatricial contraction of the entire calibre of the vagina to the extent of allowing only the point of the index-finger to pass. This cicatrix involved both edges of the fistula, was thick and unyielding, thus rendering operative procedure upon the latter impossible. Here by preparatory treatment I secured access to the fistula in less than five weeks, and returned the patient to Prof. Dolbeau for completion of the cure, which he then thought could be effected without difficulty.

Case 3 exhibited a urethro-vaginal and a urethro-vesico-vaginal fistula, with a narrow bridge of inodular tissue intervening, and with almost complete atresia of the entire vaginal tract. In this case I converted both fistulæ into one, and dilated the vagina to the extent of four inches in depth and two and a half in width. The fistula then presented an oval form, having

its anterior border notched at the urethra, and to the right of this point firmly adherent to the pubic bone; it measured transversely four centimetres and a half, and longitudinally about three and a half. Now, Prof. Dolbeau not wishing to undertake the coaptation of the edges of the fistula, requested me to perform the operation, which I did on the 17th of March. Firm union was effected at the first trial all but two small points separated by the urethra. The left opening, the size of a No. 6 catheter, was caused by the cutting of a corresponding suture, and the right, the size of an ordinary probe, stood directly in the line of union. Both of these little remaining fistulæ can now be easily united, and the whole closed at a second operation, which Prof. Dolbeau will perform soon.

The principle of treatment employed in the third case has been commented upon at length and in a manner highly appreciative by Dr. Paul Berger, Professor to the Faculty of Medicine of Paris, and to this publication I would respectfully refer all who may feel an interest in the subject. But I may add here that Dr. Berger in his remarks has inadvertently made two or three erroneous statements regarding certain important points of practice, which, in justice to myself, need to be corrected. For this purpose, and in order to call attention to some recent statistical facts regarding obliteration of the vagina, as a means of treating vesico-vaginal fistula, I now ask the use of the columns of the Lancet. This I deem essential for a better understanding of the subject, not only as regards the result attained in the case in question, but as a principle of general applicability to the cure of a not inconsiderable class of cases, usually regarded amenable only to tentative expedients.

A fistula, whether small or large, complicated with atresia in any form, is, to use a military expression, the stronghold, to be reached only in two ways—namely, by direct attack and by gradual approaches. The first mode, I need scarcely say, was the one adopted by Jobert (de Lamballe), who made various superficial and deep incisions, principally upon the anterior wall of the vagina, for the purpose of freeing the borders of the fistula and gliding the tissues, his object primarily being to close the fistula. This procedure he called *autoplastic par glissement*, and the plan, excepting the detachment of the bladder from the cervix uteri, and from the pubic arch, has ever since formed a prominent feature in the practice of almost all surgeons. The second mode I adopted: first, for the purpose of freeing the edges of the fistula by incisions upon one or both walls of the vagina, and restoring the organ as nearly as possible with dilators to its normal dimensions; and, secondly, as a measure of closing the fistula by coaptation of its edges. Now to continue the analogy in regard to these preparatory and

ulterior operations, and for the want of a better designation, I beg leave to call my procedure *autoplasty by gradual approaches*, a term which seems especially appropriate, since it is really descriptive of it.

A method which approached nearest in principle to the last named was that of Desault—namely the employment of the tampon. But when it is recollected that Desault only recommended the tampon in cases uncomplicated with atresia, and simply as an obturator of the fistula, it will be seen that the analogy is not complete. This procedure, in contradistinction to the other two, may be designated as one of *circumvallation;* and while it did favour the contraction of the largest-sized fistulæ, it was quite insufficient to complete the closure even of the smallest, save, in exceptional cases, when associated with the important auxiliary of cauterisation.

As to how I was first led, in 1854, to make the combination of repeated incisions and intravaginal dilatation with closure of the fistula, it is not necessary to refer in this connexion. Suffice it to say that the plan was modified and extended from time to time, and did not reach its highest perfection until 1867. At that time I completed my bivalve self-retaining speculum, founded upon the principle of the parallelogram of forces, which enabled me to apply a powerful and regulated force to the whole length of the contracted vaginal walls, and at every stage of the dilatation to discover and surmount even the smallest points of resistance—a thing I had not previously been able to do with the so-called duck-bill speculum, in a certain class of cases where obliteration of the vagina seemed to be the only alternative. To such a category, for example, belonged the third case at the Hôpital Beaujon. The invention about the same time of my "knee-chest support," which secured the steadiness of the patient, and rendered anæsthesia safe in the anterior position, also contributed no little to the completion of the procedure as a whole.

As to the details of the procedure by gradual approaches, it is unnecessary to go over them here. This point has already been made sufficiently clear for all practical purposes by the able reports of Dr. Berger and of Dr. Bandl, of Vienna. I will take the liberty, in this connexion, to say that the manner in which these gentlemen have presented the subject is in very striking contrast with the criticisms in the last named journal of Jan. 15th upon my operations in the General Hospital at Vienna illustrating the utility of this new principle of treatment. Here the writer seems to have no higher view of the matter than the hackneyed one of sutures, and to entertain the opinion that a woman with a fistula, treated by having her *vagina shut up*, is as well off as another cured by *obliteration of her fistula*.

In Germany and Austria, I need scarcely say, *kolpokleisis*, or obliteration of the vagina, in some part of its course, is a very favourite procedure with a large majority, if not all, of the leading surgeons—a fact which may account, to some extent, for the unjust criticisms of the writer referred to. To give some idea of the extent to which this operation is carried on in those countries I will remark that during my sojourn there of twelve months, I saw sixteen cases of fistula, principally of the varieties vesico-vaginal and urethro-vesico-vaginal. Out of this number five were actually subjected to the operation for obliteration in the urethral portion of the vagina with the following results. Two died on the sixth day after the operation from phlegmonous inflammation and other complications; one, in which a small opening remained, became pregnant subsequently, and at full term ruptured the perineum and the recto-vaginal wall, and was left with such an increase of the original difficulty as was thought to be beyond the reach of any operative procedure; the fourth, a young woman completely unsexed, was threatened by her husband with abandonment unless she had the obstacle to his marital rights removed; the fifth, who had already undergone four or five operations, remained with the vagina at the seat of closure sufficiently patulous to permit the passage of the index-finger into the cul-de-sac above, and into the fistulous opening of about the same size; while four others, presenting various complications, were thought to be incurable by any other procedure: making in all nine, 56¼ per cent., with a mortality of two, 12½ per cent. In justice, however, to Prof. Simon, the inventor of this well-known expedient, it is proper to remark that he resorts to it much less frequently than his numerous followers, who, having less experience and skill than their master, resort to it where he would consider it unnecessary—a fact of which I became thoroughly convinced from my own personal observations.

Dr. Berger, in his remarks, justly says my procedure is one of *anaplastie*, and may be divided into two stages. He then enumerates what he conceives to be the advantages and the dangers of it in practice.

First, as to the advantages, I am pleased to say he has rendered these duly prominent in regard to the restoration of the calibre of the vagina, the freeing of one or both edges of the fistula, and the paring of the latter almost perpendicularly at the expense of the entire thickness of the vesico-vaginal septum, in contradistinction to the broad vaginal denudations, usually described by authors as a distinguishing feature of the so-called American method. This last point of practice, is not properly appreciated by many operators, and hence the failures which they often meet with, especially in the class of fistulæ with

their borders and surrounding inodular tissue. To these advantages he might have added that recto-vaginal fistulæ are equally amenable to the same plan of treatment, even when they are situated in the posterior cul-de-sac, and the way is intercepted by thick and resisting cicatrices—a matter of no little importance, when a vesico-vaginal fistula coexists, and the question of obliteration of the vagina is presented. But the great and overshadowing advantage is the avoidance of obliteration of the vagina, which Dr. Berger has sufficiently indicated, though not strictly in accordance with the range of my experience. Here he does me slight injustice in stating that I believe every case of fistula can be cured by the system of gradual approaches. What I do believe and claim is that in 90 per cent. of all cases the fistula itself can be obliterated, and the normal menstrual and sexual functions be preserved, and that of the 5 per cent. in which this cannot be effected, and obliteration of the vagina seems to be called for, little or no permanent good can result to the sufferer from the latter expedient, however successfully accomplished.

In the latter class of cases, according to my observations, the vagina is reduced to a mass of inodular tissue, somewhat resembling cartilage, complicated with partial or complete destruction of the urethra, or with recto-vaginal fistula, or with laceration of the perineum and the recto-vaginal wall—a condition of the parts rendering continence of the urine only possible in a few cases, and clearly impossible in all the others, to say nothing of the dangers attending the operation itself. I therefore insist that it is better in all such cases to leave the outlet of the vagina free for the unobstructed flow of the secretions, and to trust alone to a well-adjusted tampon or compress for the comfort and protection of the patient. This leaves five 5 per cent. for deaths, a maximum of mortality which in my experience, I am happy to say, has not yet been reached.

Next, with regard to the disadvantages or dangers of *autoplasty by gradual approaches*. Of these Dr. Berger mentions rupture of the peritoneum, rupture of the bowel, and phlegmonous inflammation. Now, I think I am justified in saying that Dr. Berger has invested all these accidents with an undue importance, both in his review of Dr. Bandl's memoir and in his remarks now under consideration, as will appear by reference to the following facts bearing upon these points.

The word "rupture" conveys to my mind the idea of unwarranted violence, and consequently is to be regarded as a somewhat unavoidable accident liable to occur in any and all cases without the greatest care; whereas, the reverse of this is true, excepting care and prudence, which of course are to be

observed by the surgeon under all circumstances. Of the case referred to in the hospital at Vienna, in which a small opening in the peritoneal cavity was made, the accident was unexpected, it is true, but fortunately it terminated without serious consequences, and the patient was cured with unimpaired menstrual and sexual functions—a result thought by competent surgeons to be quite out of reach by the ordinary resources. Here there was a cicatricial band, which stretched across the vagina just under the posterior lip of the cervix uteri, which prevented the necessary depression of the uterus for closure of the fistula. The latter was principally situated to the right of the median line, and had its anterior border fixed to the posterior surface of the pubic bone, a condition of the parts very rarely seen, and just such as is supposed to furnish the indications for oblique obliteration of the vagina. This band, after having been put upon a slight stretch with my speculum, was carefully incised to the left of the median line. It showed no signs of yielding under the knife and pressure of the finger until complete division had been effected, when it gave way, and with it the subjacent peritoneal covering. I had often before made divisions of cicatrices in the same locality, and seen them yield by the same practice, and there was no obvious reason why such a result would not follow without accident in this instance. A single accident, however, of this kind in an experience of nearly a quarter of a century cannot, I think, be regarded in a very serious light, especially when the character of the fistula, the principle of the operation, and the final result, are considered. But this experience is not without value. In future I shall content myself in such cases with making two or three superficial incisions across the resisting band, and then trusting to dilatation. By pursuing this course, only a little more time will be required to accomplish the same end.

As to rupture of the bowel, I can only say that I have not yet encountered such an accident. In one instance I purposely opened the rectum in order to reach the required dilatation of the vagina, and to place healthy tissue between the two ends of the divided cicatrix, with the ulterior object of relieving the neck of the bladder, also encircled by a cicatricial band, and the seat of a urethro-vesico-vaginal fistula. Both fistulæ in this case were closed, each at one operation, and a most excellent result secured.

I may say there is a certain form of vaginal atresia resulting from other causes than those attending parturition, in which the above practice is not only justifiable, but preferable, in order to save time and secure the best results. An illustrative case of this character I saw in the hospital at Vienna in the service of Prof. Carl von Braun.

Phlegmonous inflammation, Dr. Berger says, is to be apprehended from incisions and lacerations of inodular tissue. His reasons for this belief are entirely *apropos*, and would seem to have some foundation in fact, but my clinical experience does not justify such a conclusion. When it is recollected that in the treatment by gradual approaches a free outlet for the vesical, vaginal, and uterine secretions is maintained, and that the greatest possible cleanliness is observed, the truth of my assertion will be obvious. With these precautions, and the daily application of a solution of nitrate of silver to the exposed vaginal wounds, coupled with judicious pressure of the dilator, the dreaded danger referred to ceases in a great measure to be a factor in the relationship of cause and effect. It is this, I conceive, that places the principle of *autoplasty by gradual approaches* in so favourable a contrast with that of obliteration of the vagina or kolpokleisis. In the latter procedure the extensive denudations required upon the two vaginal walls, perhaps already in a somewhat morbid condition, are more or less exposed, in and above the seat of operation, to the poisonous action of decomposed blood, pus and urine, which can only find an outlet through the narrow urethra—a condition of things eminently conducive, it must be admitted, not only to phlegmonous inflammation, but to pyæmia.

In support of what is above stated in contravention of the alleged dangers of my procedure, I may say that out of more than one hundred of all classes of cases I have lost but three: one in 1858, in the Royal Infirmary at Edinburgh; and two in 1861, in my private hospital in New Orleans. The first case was that of a woman with complete incarceration of the cervix uteri in the bladder, and who was in a bad state of health, superinduced by alcoholism and other effects of irregular and vicious habits. In this case the object of the operation was to restore the os uteri to its position in the vagina and at the same time obliterate the fistula. Both of these ends were obtained most satisfactorily; but, unfortunately, phlegmonous inflammation supervened, which terminated in pyæmia, and death on the sixth day. In the second case, the patient, having a small uncomplicated vesico-vaginal fistula, died on the fifth day of the operation—it is believed, from septicæmia induced by infection of the hospital from a case of erysipelas. Two other cases in the same ward which had been operated upon—one for laceration of the perineum six days before, and the other for hypertrophy of the cervix uteri two weeks before, died almost on the same day, having identical symptoms; thus showing that death in the case of fistula was due to a cause other than that of the operation. In the third case, the patient, whose health was somewhat impaired, and who had a small fistula

complicated with partial atresia, died on the fourth day after lateral incisions had been made. Here, from the smallness of the incisions, the comparatively little inflammation which followed, and the similarity of some of the symptoms to those of the above cases, there is reason to believe that the poisoned condition of the hospital played a most important part in producing the fatal result, although several months had intervened and every precaution had been taken as to cleanliness and disinfection.

Now, as to the closure of the fistula and the best means of doing it. These points, although totally disregarded in the first stage of *autoplasty by gradual approaches*, are, nevertheless, of paramount importance as regards the final result, and cannot be passed over, as is too often the case, by the mere assertion that one method is as good as another. They acquire, I conceive, additional interest at this juncture from the fact that many surgeons in France, Belgium, and Italy have faltered in their support of the suture, including the much-vaunted American method, and now strongly advocate, even in simple and uncomplicated cases of fistula, a return to the old methods of cauterisation, and of hooks or claws, as employed by Naegelé, Lallemand, Laugier, and others, designating the latter as the *méthode par réparation immédiate secondaire.*

Professor Amabile, of the Royal University of Naples, has had the kindness to send me a most interesting *brochure* upon this subject. With regard to the suture he says:—"The treatment of vesico-vaginal fistula by means of paring and suture, notwithstanding it has given splendid results, and been earnestly extolled in our day, has never popularised itself among surgeons, and rests at present in the hands of a few. Often in a country only one or two surgeons employ it. Distinguished operators, wishing to try it, have often given it up after their first failure. Again, patients, when fully impressed with the gravity of their disease, often cannot make up their minds to submit to a repetition of this mode of treatment, because it is, if not very painful and dangerous, always laborious, long, and tedious for everybody—the surgeon and assistants even more than themselves."

Now, with the acknowledged superiority of the suture to the above old methods, even by the class of surgeons in the countries named, it is easy to see why this lukewarmness in its support has sprung up. It can be referred to no other cause, as I believe, than want of success, resulting, in a great measure, first, from inattention to the morbid conditions of the vagina other than that of the fistula itself; secondly, from the employment of too broad or flat surfaces in the paring of the edges of

the fistula; and, thirdly, from the adoption of the dorsal or lateral position of the patient.

The three forms of suture best adapted to the closure of the fistula, are, unquestionably, the simple wire interrupted, the double silk interrupted, and the button wire interrupted, which I name in the order of their first adoption. The first and the second forms are now most generally employed by surgeons, under the belief that they are more simple and quite as efficient as the last mentioned.

Now, without stopping to discuss the subject, I will simply say that, while the above convictions may be correct as to uncomplicated cases of fistula, they cannot be accepted as such, with regard to efficiency, in the second stage of *autoplasty by gradual approaches*, where it is all important that success should be secured at the first application. Here something more than the simple or double suture is needed, in order to counteract the tendency of the vagina to recontract, and to hold the edges of the fistula quietly in their extended relationship while the healing process is going on. This is no less essential, I conceive, than the application of splints or the immovable apparatus to keep the ends of a broken bone in a state of perfect quietude. The tendency of the vagina to recontract is not characteristic, it is true, of all cases of atresia, but there are many in which it does exist; as, for example, when the cicatrices upon both walls are extensive and have not been completely mobilised, a condition of the parts which actually did present itself in the last case treated at the Hôpital Beaujon. Here the vagina recontracted from sixty-five to fifty millimetres in twelve days, thus showing the extraordinary strain to which any unaided form of interrupted suture would have been subjected in holding the edges of the fistula together in the centre, where the retraction is always greatest.

Any suture, therefore, which counteracts this tendency of the edges of the fistula during the healing process, to change their relationship, will succeed oftenest at the first application. Hence it is my honest belief that there is no form of suture which will fulfil these indications so completely as the button-wire interrupted. Without it I insist that it is quite impossible for any surgeon, however skilful he may be in the treatment of the first stage of *autoplasty by gradual approaches*, to ever succeed to any considerable extent in the *second*—the obliteration of the fistula; because a repetition of operations in this latter stage is not only demoralising to the patient, but to the surgeon himself, and must in the majority of cases result in disastrous failure. But be this as it may, let the surgeon in all cases make the rough work of the first stage of the treatment, for in the same

proportion as he succeeds in that regard will be increase his chances of success in the second, whether the simple, the double, or the button interrupted suture be employed. As for my part, I always use the third form—the *button suture;* and my convictions of its superiority to the other two, for the reasons given, are thorough, being the result of long experience and fair trials with the best operators of my country in the same cases and upon the same fistulæ.

Now to show the favour in which *autoplasty by gradual approaches* is held in Austria, where it has been subjected to the severest test, I may be pardoned for adding here a short extract from a manuscript letter of June 15th, addressed to me by Dr. Ludwig Bandl, of Vienna, assistant of Prof. Carl von Braun. He says: "It will no doubt please you to hear that ever since the publication of my article upon your method of treating vesico-vaginal fistula (*op cit.*) cases have continued to pour into our clinic. We have at present twelve under treatment, the greater part of which being of the most difficult character. I have myself, by permission of Prof. Braun, already operated upon two. My first case, presenting a large fistula, and being otherwise difficult, I cured at two operations. My second case, thought by Prof. Braun to be incurable, I have operated upon twice. In the first operation I had to use a button of angular form and bent upon its axis, with nine sutures. The result was a closure of about four-fifths of the fistula. In the second operation I used four sutures and a suitable button, and reduced the size of the fistula to that of a surgeon's probe. I hope to complete the cure at another operation. My third case I expect to operate upon in a few days. Here the fistula is very large, being of a T shape. Only 1½ ctm. of the outer portion of the urethra remains. The upper border of the fistula, after two months' preparatory treatment, has been made quite as movable as it was in your fourth case operated upon here. I hope to close the greater part of this fistula at the first operation."—*Lancet, Nov.* 4, 1876, *p.* 633.

68.—ON THE METHOD OF OPERATING FOR VESICO-VAGINAL FISTULA,

BEING A COMPARISON OF BOZEMAN'S OPERATION WITH THAT OF THE AUTHOR.

By the late PROF. SIMON, of Heidelberg.

[In the autumn of 1874, Herr Bozeman, of New York, came to Heidelberg, and he and Prof. Simon agreed to institute a practical comparison between their respective methods of operating.

Our methods differ from each other in very essential points. While I operate on the patients in the supine position, with the buttocks much raised (an exaggerated lithotomy position), Bozeman makes use of the knee-elbow position, in which he fastens the patient. While I endeavour to draw forwards the parts bordering on the fistula, whenever this can be attained, Bozeman performs the operation while the parts remain in situ. While Bozeman pares the edges for the most part with scissors, I operate almost exclusively with the knife. While Bozeman employs a very complicated wire suture, I use a simple knotted suture of silk thread; and while Bozeman in the after-treatment keeps a catheter permanently in place, and often gives large doses of opium, I enjoin no measures of precaution whatever, but allow the urine to be passed at pleasure, and permit the patient to leave her bed even on the second or third day, if she pleases. Even in cases in which a preparatory treatment is necessary, in order to render the fistula accessible to the instruments with which the operation is to be performed, I make choice almost exclusively of a rapid preparation, immediately before the operation; while Bozeman in all these cases prefers the gradual preparation.

The cases operated on by me were the following:

Case 1.—A Russian woman, twenty-two years of age, of small stature, was the subject of a very large fistula. The whole base of the bladder as far as the os uteri, and the upper part of the urethra, were deficient; of the latter only a length of $2\frac{1}{4}$ cm. remained. The aperture extended to the sides of the vagina, and upwards into the lateral culs-de-sac. The bladder was prolapsed as far as the entrance of the vagina. In Berlin one operation had been performed without success.

I had left to Bozeman and to Spencer Wells, who was staying several days at Heidelberg, the choice whether I should operate upon this great aperture, or upon a fistula measuring only from $1\frac{1}{2}$ to $1\frac{1}{4}$ cm. in diameter, which was equally at our disposal. Both gentlemen preferred to see the operation on the large aperture.

The loss of substance could in this case only be remedied by drawing the uterus forward, and making use of it to close the aperture. By using some force I was able, with a fine pair of *Museux'* forceps, so to draw forward the anterior lip of the *os uteri*, that it came into contact with the urethra. I pared the edges (including at the posterior margin the anterior lip of the *os*), a proceeding which involved any great difficulty only at the posterior angles, and brought them together with eleven sutures. The line of union formed a semicircle convex forward. On the first day only the urine had to be drawn off by catheter, from the second day onwards the patient was able to pass it at

pleasure. On account of the extent to which the bladder was involved in the incisions, and the tension of the parts united, spasmodic pains in the bladder arose, which did not cease until towards the fourth day, and for the first two days there was a frequent recurrence of vomiting. Between the fifth and eighth days the sutures were removed. The aperture was closed with the exception of a small fistula about as large as a pea at the point of union of the anterior lip of the os with the urethra. This small fistula was afterwards operated on by Bozeman. (See Bozeman's second case.)

Case 3.—The fistula was in the upper third of the urethra, about 2 cm. distant from its orfice. The fistula presented a transverse slit, which was only ¼ cm. broad) but 2 cm. long. The vagina was at this spot so narrowed that the points of two fingers could scarcely be passed through it. The opening lay in a deep pit in the walls of the urethra and bladder, which was drawn in towards the arch of the pubes, and was firmly adherent to it. The edges of the fistula were very thin. The cicatricial narrowing of the vagina extended longitudinally more than ¼ cm. The operation for transverse obliteration of the vagina had formerly been performed on this patient by a German surgeon. I had again separated this obliteration, in order to close the fistula itself, since it appeared not impossible to cure it.

With a view to the operation, I wished to divide the ring-like contraction of the vagina, and immediately afterwards operate on the fistula, as I had always done in such cases. Bozeman, however, thought that the result would be very doubtful if the gradual dilatation of the vagina were not previously undertaken, and offered to carry out this dilatation in a fortnight. He divided the cicatricial bands with the knife, and introduced soft dilators of indi-rubber and gum-elastic. The patient, however, suffered from them the most frightful pain in the vagina, the hypogastrium, and the loins, and was attacked by such a high degree of fever, accompanied by rigors, that we saw her health to be seriously threatened. On this account, after a treatment of six consecutive days, the use of the dilators was abandoned. After the patient had recovered, the contraction of the vagina appeared to be almost as marked as before the attempt at dilatation. At the same time we ascertained that in the neighbourhood of the anterior lip of the os uteri a new very small fistula had been formed. This fistula had probably not arisen from ulceration set up by the use of the dilators, but the dilator had rather torn asunder a small cicatrix which was in this situation. No trace of ulceration was to be seen. A renewed trial of the gradual dilatation I did not consider to be admissible, nor, according to my experience, necessary. Before the operation, I divided with the blunt-pointed knife the

bring into view the margins of the fistula, which were much thinned. I then pared very broadly the margins, and the deep pit in the walls of the urethra and bladder. The union was effected with six sutures. The application of these was very difficult, especially at the left angle. Immediately after the patient was placed in bed some of the urine escaped involuntarily, and this escape did not afterwards cease. The sutures were removed between the fifth and seventh days, and we then saw the urine flowing away from the left angle of the fistula. No opening was to be found, because we did not dare to separate the folds between which the fistula lay. At length, towards the fourth week, we found a very small opening quite at the left extremity of the fistula, which elsewhere was completely healed. This lay beyond the point of application of the last suture, and had therefore never been closed. Thus was explained the involuntary escape of urine, immediately after the patient was placed in bed. Unfortunately I had neglected to test the closure of the fistula on the operating table by injecting water into the bladder. Had I done this the small opening would have been discovered and closed.

In the course of the summer of 1875 I operated twice more on the small remaining fistula. On the first occasion the closure was not effected, because again the sutures were not applied with sufficient exactness, for immediately after the operation the urine again escaped involuntarily. At the second operation a complete cure was effected.

Bozeman performed the following operations:—

Case 1.—A patient, about thirty years of age, had a fistula situated in the anterior vaginal cul-de-sac, which measured about 1¼ to 2 cm. in diameter, and admitted the passage of the forefinger. Its posterior margin was formed by the anterior lip of the os uteri. It lay in the middle line, and was tolerably easy of access, because the vagina could be dilated very readily. After bringing the fistula into view in the knee-elbow position, Bozeman incised the anterior edge with the knife, the posterior with scissors, and enlarged the opening to a considerable extent, paring the edges very broadly. These were united by five sutures in a transverse direction, and the anterior lip of the os thus united with the septum between vagina and bladder. On the eighth day the stitches were removed. In the division of the ends of the wire, which were secured by perforated shot, one loop of wire became so retracted within the tissue that it could not be secured. The fistula was completely closed; the loop of wire still remains. The allowing of a piece of wire to remain Bozeman regards as altogether harmless. I have had nowever to crush a stone in the bladder, whose nucleus was formed by a loop of wire. The loop had been left behind in an operation for vesico-vaginal fistula, performed a year before.

freely as far as the lateral vaginal cul-de-sac, in order to render the uterus more movable, pared the edges very carefully, drew the uterus still further forward, and fixed it with six sutures to the anterior incised margin. The urethra was united to the os by a central stitch, while the other stitches carried deeply at each side of the urethra united the uterus to the vaginal wall, and drew it towards the vulva. When the sutures were removed on the fifth and sixth days, it was found that only half of the margins had united. Doubtless the great tension caused this want of success.

At the following operation I again divided the united part of the fistula, and, as in the preceding one, the cicatrix of the great aperture widely towards the lateral culs-de-sac. The anterior margin of the fistula was pared very superficially and obliquely, so that of the whole thickness of the wall of the urethra only 2 mm. were removed. The union was effected by eight sutures, two of which united the urethra with the os uteri. On this occasion I was not content with combating the tension by deeply-placed sutures in the neigbourhood of the urethra, but I also set free by incision the urethra from the arch of the pubes, and incised the sides of the cervix, after Jobert's method, to the depth of 1¼ cm., to render the anterior lip of the os moveable. This time complete union was secured. But continence of urine was only perfect in the supine position. In walking and standing the urine began after from a quarter to half an hour to escape involuntarily. The length of the urethra was 1¼ cm. at most.

Case 3.—A woman, thirty-eight years of age, had a fistula in the left vaginal cul-de-sac, large enough to admit the tip of the forefinger. It formed a transverse slit, 1¼ cm. long, and ¼ cm. broad. In front of the fistula the vagina was contracted by a thin cicatricial band, but not to a great extent. The edges of the fistula seemed to be adherent to the bones. I endeavoured to expose the fistula in the supine position which I usually adopt, but found that this could not be very completely effected. I thought that it was very inaccessible, and that the peritoneum might easily be injured by the incisions or the sutures. I expressed the opinion that an attempt should be made under chloroform, after incision of the cicatricial bands, to bring the fistula into view, but that, in case this should fail, it might be necessary to leave the fistula itself, and close the lateral cul-de-sac, including the os uteri, as I had done in one case. By this means any danger to the peritoneum would be avoided. I made, however, no further attempt at exposing the fistula, but handed over the patient to Bozeman for the operation, in order to see how he would expose the fistula in the knee-elbow position.

Bozeman carried ont the preparatory treatment by first incising the cicatrices, and then introducing dilators. No very deep incisions were necessary, and the cicatrices readily yielded to dilatation. At the end of ten days the operation was performed, and I saw that the fistula was brought very well into view in the knee-elbow position with Bozeman's speculum. Nevertheless, it was very difficult to reach it with instruments. Paring the edges occupied more than two hours, and the size of the fistula had to be very greatly increased to complete the incisions at the left angle. There was the same difficulty in passing the sutures, five in number, and this process occupied 2¼ hours. The whole length of the operation was, therefore, 4½ hours. As after-treatment, large doses of opium were administered, and a catheter was kept permanently in place. On the eighth day Bozeman himself removed the sutures. The original fistula was healed, but immediately in front of the os an opening remained through which, when the patient left the hospital three weeks after the operation, the tip of the forefinger could be passed, which was as large therefore as the original fistula. The condition of the patient was so far improved that the remaining fistula was in a far more accessible situation, and therefore easier to cure. Owing, however, to the severity of the operation and of the after-treatment, the patient was so reduced in strength that she could not immediately make up her mind to any further operation. Up to the present time she has not returned to Heidelberg.

In estimating the results of the two methods of operation, we must set aside altogether my second operation. The patient was suffering at the time of the operation from severe suppurative pyelitis, and to this she succumbed. The autopsy showed that the substance of both kidneys was almost completely destroyed, and that a stone was still impacted in one ureter. Under these circumstances, which could not have been recognized in their full extent before the operation, the patient, as Bozeman himself admitted, would have died under either method of operation, and the fistula would have separated again.

There remain therefore three cases of each method for comparison. My results were the following:—In the first case a small fistula about the size of a pea, or about a twenty-fifth part of the line of union, remained open. In the second, after the spontaneous closure of a small remaining fistula, which took place from three to four weeks after the operation, complete cure was attained; and in the third, the fistula was closed with the exception of a small spot at its left angle, which lay beyond the sutures.

Bozeman attained a complete cure in his first case; in his second the whole fistula reopened, and the patient became in-

incurable; and in the third about four-fifths of the line of union were closed.

My results are therefore absolutely, and, as we shall presently see, also relatively better than those of Bozeman. For even if we set down the small fistula, which remained in my fourth case, to the account of the method of operating, and not of my carelessness, this formed only about the fifteenth part of the line of union. On this assumption we have to set openings of one-twenty-fifth and one-fifteenth part of the line of union in my cases against a total failure, and an opening of one-fifth of the line of union. In order, however, to arrive at a right judgment on the advantages of one method over the other, it would be necessary, the number of cases being so small, to take into account the quality of each—that is to say, we must see what difficulties impeded the execution of the several operations, and the process of cure after the operations were completed.

The execution of the operation may be impeded by an inaccessibility of the fistula of such a degree that the paring and uniting of the edges can be only imperfectly accomplished. With the large aperture in my first case, it was only at the furthest angle that I had to overcome difficulties, which prolonged the operation indeed, but did not prevent its accurate accomplishment. In the third case bandlike adhesions impeded the execution. These were divided, and the hindrance thereby avoided. In my fourth case also the incisions and insertion of sutures were rendered very difficult by the position of the fistula in a deep fold, firmly adherent to the bones; and this difficulty brought about the result, that a small spot at the left angle was not included in the suture, and remained open. But the success of the later operation showed that I might have rendered the parts completely accessible.

In Bozeman's cases the first two fistulæ were very easy of access, the last, on the contrary, very difficult. It lay in the left vaginal cul-de-sac, and so high up that I was led, after a superficial examination, to speak of the possibility of being obliged to have recourse to obliteration of the vagina. Bozeman, however, after a gradual dilatation of the vagina, and a very troublesome operation lasting four and a half hours, succeeded in making incisions and inserting the sutures in an exact manner. In all six cases accessibility was so far secured that the first essentials for the cure of a fistula—the incisions and the sutures—were such as fully to content the operator.

As hindrances to the healing of the incisions the following may be mentioned:—

1. The unusual size of the aperture. In my first case the defect extended over the whole septum between vagina and

bladder, even to the lateral cul-de-sac, and also to the wall of the urethra. The uterus could indeed be drawn so far forward that the anterior lip of the os came into contact with the remnant of the urethra, but the tension thereby produced was considerable, and the line of union very long. My two other fistulæ were transverse slits of moderate size. In Bozeman's cases the size of the fistulæ could cause no difficulty. The largest had the moderate dimensions of about 1½ cm. longitudinally, and 2 cm. transversely. Of the two others, one was about the size of a pea, the other admitted the tip of the forefinger.

2. The fact of the urethra being involved. Fistulæ which involve the urethra are far more difficult to cure than those which lie higher up, provided that the latter can be rendered accessible to instruments. For not only is the wall of the urethra far thinner than that between vagina and bladder, but, to secure continence, it is necessary to spare tissue as much as possible, a consideration which has not to be taken into account in fistulæ which lie above the urethra. The greater is the loss of substance of the urethra, the more difficult is the cure, because the thickness of the muscular coat, and with it of the whole wall, diminishes from above downwards, and the danger of incontinence increases. With a length of the urethral wall of 3 cm., which is nearly equal to the normal length, the prognosis is still fairly favourable. With a defect which reaches to a distance of 2½ cm. from the orifice, there is already reason to fear that if the incisions are carried at all far forward (as to a distance of ½ or ¾ cm.), union may fail on account of the thinness of the margins, or, if not, continence may not be secured.

In all my cases the urethra was involved. In the first, a length of 2¾ cm. of it remained; in the third and fourth the fistulæ lay in deep transverse folds, distant only from 2 to 2½ cm. from the meatus. Of Bozeman's cases, the urethra was defective only in the second. In that it had a length of 2½ cm.

3. Cicatricial contractions and adhesions of the vagina immediately at, or in the neighbourhood of the margins. In the third and fourth of my cases these hindrances were present. In the third there was a band-like contraction, 1½ cm. broad, above the fistula; in the fourth the vagina was obliterated from the posterior margin of the fistula up to the os uteri, with the exception of a narrow canal. If such cicatrices are divided by knife or scissors immediately before the operation, in order to render the fistula accessible, or its edges moveable, it is possible that in uniting again they may cause so much tension upon the margins, that the fistula opens again at the end of six or seven

days. This is especially to be feared if there is a strong tension to overcome at the time when the sutures are fastened, and in an earlier case I have myself observed separation to take place under such circumstances. Bozeman, in both my cases, regarded the cure as very difficult without a preparatory treatment, and sought to prepare the parts for my operations by gradual dilatation after incision of the prominent bands. When this attempt had failed, I undertook the operation nevertheless, trusting that my mode of paring the edges and inserting the sutures would be a sufficient guarantee against the effect of these disadvantages, especially since the edges could be brought together without tension. I divided the cicatricial bands, so far as they interfered with the operation, united the margins, and attained a successful result.

Bozeman in his third case only found a small band of adhesions narrowing the vagina. This he removed by gradual dilatation before the operation, so that it could have no effect in hindering union.

4. Neighbourhood of the ureter, or opening of its mouth on the margins of the fistula. This circumstance appears to me to be no hindrance to the cure, but I mention it here, since Bozeman thinks otherwise, and, in his third case, ascribes to it the opening which remained, assuming that this was due to the ureter being included in the suture. But even allowing it to be a hindrance to cure, it cannot possibly have been the cause of the fistula which remained in Bozeman's case described above. For this lay immediately in front of the os uteri, and at least 1 cm. distant from the ureter. The orifices by which the ureters open into the bladder correspond to points in the vagina distant about 1 cm. outwards from the outer edge of the os uteri, and about $\frac{1}{4}$ cm. in front of it. Hence in this case the ureter might far more easily have been included in the space where union took place, than at the spot where it failed. But, as I have previously expressed my opinion, the neighbourhood of the ureter seems to have no bad effect upon the result. For I have operated upon a number of fistulæ, which were situated at, or extended to, the spot where the ureters lie, but I have never observed a symptom proving that a ureter had been closed, nor have I very often seen an opening remain at the corresponding spot. In these cases either the ureter was not included in the suture, or not thereby occluded, or the thread cut through its wall so quickly that no lasting suppression of urine was caused. It is most probable that, in small fistulæ, at most only one wall of the ureter is included in the suture, because it lies immediately beneath the mucous membrane of the bladder, which, in small fistulæ, is not usually included within the stitches. In fistulæ where the ureter obviously opened upon the margin, I

cicatrices which caused the narrowing of the vagina, and especially cut through the bands, which at both sides firmly fixed the angles of the fistula to the bones. I then pared the in-drawn edges of the fistula very broadly, and united them by five sutures. The sutures were removed between the fifth and seventh days. The fistula was closed, except a very small transverse slit in the midst of the cicatrix. I prophesied that this small fistula would very probably heal spontaneously, because it lay between very deep margins. On the tenth day the patient was attacked by a catarrh of the bladder, which lasted fourteen days, accompanied by considerable fever and pain in the kidneys. After four weeks these symptoms had vanished, and an examination showed that the small opening had closed, and thus the whole fistula was completely cured. In the following summer I operated on the small fistula by the os uteri which had arisen during the gradual dilatation, and closed it by two sutures, with a successful result.

Case 4.—A patient, twenty-six years of age, had a transverse fissure in the upper part of the urethra, at the point of union of the urethra with the bladder, accompanied by very marked contraction of the vagina. The fistula lay in a deep pit formed by the drawing-in of the walls of the urethra and bladder, situated at a somewhat greater distance from the orifice of the urethra than in the former case—namely, one of about $2\frac{3}{4}$ cm. The vagina was narrowed by cicatricial bands at the position of the fistula, and fixed by adhesion to the bones at each side. About $\frac{1}{4}$ cm. behind the fistula began a thick cicatrix, reaching to the os uteri, by which the vagina was almost completely closed. Only on the right side could the sound be passed through a narrow canal into the neighbourhood of the uterus. The extent of the fistula in a transverse direction was about 2 cm., longitudinally only $\frac{1}{2}$ cm. Its margins were adherent to the arch of the pubes, and on this account could with difficulty be laid open to view. The angles of the fistula especially were deeply buried in indurated tissue. In this patient also Herr Bozeman first made an attempt to dilate the vagina for me. After division by the knife of the adhesions nearly as far as the os uteri, dilators were daily applied; but in this case also the result was a negative one. The pains became unendurable, and as early as the second day fever set in, which soon after reached such a degree that towards the fifth day we were obliged to remove the dilators. When the febrile symptoms had subsided, the adhesions were found to be almost as firm as ever. I decided then on performing the operation without previous gradual dilatation of the vagina. By several deep incisions with the knife posteriorly and on both sides the cicatrices above the fistula were so widely separated that it was possible with retractors to

bring into view the margins of the fistula, which were much thinned. I then pared very broadly the margins, and the deep pit in the walls of the urethra and bladder. The union was effected with six sutures. The application of these was very difficult, especially at the left angle. Immediately after the patient was placed in bed some of the urine escaped involuntarily, and this escape did not afterwards cease. The sutures were removed between the fifth and seventh days, and we then saw the urine flowing away from the left angle of the fistula. No opening was to be found, because we did not dare to separate the folds between which the fistula lay. At length, towards the fourth week, we found a very small opening quite at the left extremity of the fistula, which elsewhere was completely healed. This lay beyond the point of application of the last suture, and had therefore never been closed. Thus was explained the involuntary escape of urine, immediately after the patient was placed in bed. Unfortunately I had neglected to test the closure of the fistula on the operating table by injecting water into the bladder. Had I done this the small opening would have been discovered and closed.

In the course of the summer of 1875 I operated twice more on the small remaining fistula. On the first occasion the closure was not effected, because again the sutures were not applied with sufficient exactness, for immediately after the operation the urine again escaped involuntarily. At the second operation a complete cure was effected.

Bozeman performed the following operations:—

Case 1.—A patient, about thirty years of age, had a fistula situated in the anterior vaginal cul-de-sac, which measured about 1½ to 2 cm. in diameter, and admitted the passage of the forefinger. Its posterior margin was formed by the anterior lip of the os uteri. It lay in the middle line, and was tolerably easy of access, because the vagina could be dilated very readily. After bringing the fistula into view in the knee-elbow position, Bozeman incised the anterior edge with the knife, the posterior with scissors, and enlarged the opening to a considerable extent, paring the edges very broadly. These were united by five sutures in a transverse direction, and the anterior lip of the os thus united with the septum between vagina and bladder. On the eighth day the stitches were removed. In the division of the ends of the wire, which were secured by perforated shot, one loop of wire became so retracted within the tissue that it could not be secured. The fistula was completely closed; the loop of wire still remains. The allowing of a piece of wire to remain Bozeman regards as altogether harmless. I have had, nowever to crush a stone in the bladder, whose nucleus was formed by a loop of wire. The loop had been left behind in an operation for vesico-vaginal fistula, performed a year before.

Case 2.—Bozeman operated on the small fistula, which had remained after my first operation. It lay at the place of junction of the septum between urethra and vagina, which was now only 2½ cm. in length, with the anterior lip of the os uteri, which was here united with the urethra. The anterior margin was pared with the knife, the posterior margin and the angles with scissors. The fistula was closed by three sutures, two of which lay on the right and one on the left of the urethra. The whole operation, at which Köberle of Strasburg was present, had lasted only thirty-five minutes, apart from the time occupied in fastening the patient and administering chloroform. The edges were incised in an oblique direction, the os uteri very broadly, to the extent of about 1 to 1¼ cm. At the anterior margin also, the incised vaginal wall near the urethra had the breadth of one cm., and that of the urethra itself one of a quarter cm. The fistula was considerably increased in size, and of the urethra only a length of 1½ cm. now remained. The incisions were made in entirely sound tissue, and it was therefore to be expected that union would take place. For the first few days no urine escaped. On the fourth and fifth days the patient was attacked by crystitis; the urine, previously clear, became turbid and mixed with mucus. When Bozeman removed the sutures on the seventh day, the urine escaped from the right angle of the fistula, and, on examination two days after, the fistula was found to have separated again in its entire extent, and to have become so large that the finger could be easily passed through it.

The further history of this patient was the following. On account of the greatly increased loss of substance, and the reduction of the length of the urethra to 1½ cm., the result of a repeated operation would naturally be much less hopeful than that of the former one, and it might be confidently predicted that even if the fistula were successfully closed, incontinence would remain. The conditions would be especially unfavourable if the edges were again pared after the manner of Bozeman, and yet another considerable portion of the urethra cut away. Nevertheless, Bozeman assured us that he could cure the fistula and also restore continence. I begged him therefore to repeat the operation. Bozeman, who was then obliged to leave, promised to return in the summer and perform the operation. I kept the patient in the hospital the whole summer and autumn until October, 1875, and sent Bozeman several special invitations to come again with a view to this operation. Unfortunately circumstances would not allow him to pay a second visit. I was therefore obliged to perform the operation myself.

I incised the cicatrix left by the former great aperture very

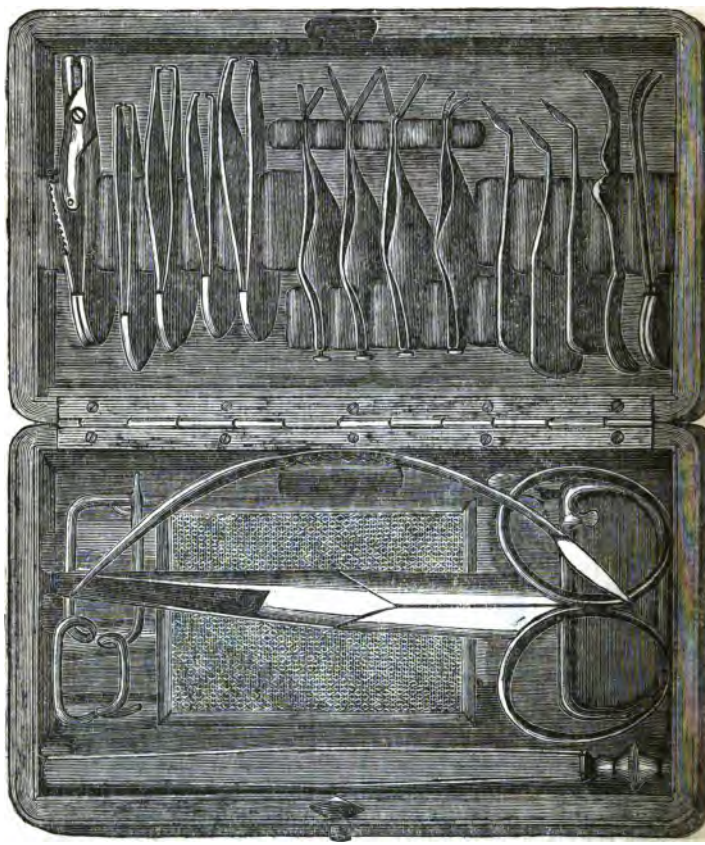
freely as far as the lateral vaginal cul-de-sac, in order to render the uterus more movable, pared the edges very carefully, drew the uterus still further forward, and fixed it with six sutures to the anterior incised margin. The urethra was united to the os by a central stitch, while the other stitches carried deeply at each side of the urethra united the uterus to the vaginal wall, and drew it towards the vulva. When the sutures were removed on the fifth and sixth days, it was found that only half of the margins had united. Doubtless the great tension caused this want of success.

At the following operation I again divided the united part of the fistula, and, as in the preceding one, the cicatrix of the great aperture widely towards the lateral culs-de-sac. The anterior margin of the fistula was pared very superficially and obliquely, so that of the whole thickness of the wall of the urethra only 2 mm. were removed. The union was effected by eight sutures, two of which united the urethra with the os uteri. On this occasion I was not content with combating the tension by deeply-placed sutures in the neigbourhood of the urethra, but I also set free by incision the urethra from the arch of the pubes, and incised the sides of the cervix, after Jobert's method, to the depth of 1½ cm., to render the anterior lip of the os moveable. This time complete union was secured. But continence of urine was only perfect in the supine position. In walking and standing the urine began after from a quarter to half an hour to escape involuntarily. The length of the urethra was 1¼ cm. at most.

Case 3.—A woman, thirty-eight years of age, had a fistula in the left vaginal cul-de-sac, large enough to admit the tip of the forefinger. It formed a transverse slit, 1½ cm. long, and ½ cm. broad. In front of the fistula the vagina was contracted by a thin cicatricial band, but not to a great extent. The edges of the fistula seemed to be adherent to the bones. I endeavoured to expose the fistula in the supine position which I usually adopt, but found that this could not be very completely effected. I thought that it was very inaccessible, and that the peritoneum might easily be injured by the incisions or the sutures. I expressed the opinion that an attempt should be made under chloroform, after incision of the cicatricial bands, to bring the fistula into view, but that, in case this should fail, it might be necessary to leave the fistula itself, and close the lateral cul-de-sac, including the os uteri, as I had done in one case. By this means any danger to the peritoneum would be avoided. I made, however, no further attempt at exposing the fistula, but handed over the patient to Bozeman for the operation, in order to see how he would expose the fistula in the knee-elbow position.

occurrence can be performed. In the lower half are seen, besides the above described instruments, a pair of strongly curved scissors, below these the thin case (fig 4) containing twelve instruments, each of which fits into the same handles near them.

Fig. 8.



When closed the case is three centimètres high, weighs 4½ ounces, and is therefore easily carried in the pocket.—*St. Thomas's Hospital Reports*, 1875, *p.* 163.

70.—ON GLAUCOMA.

By R. Brudenell Carter, Esq., Hunterian Professor of Surgery and Pathology to the College, and Ophthalmic Surgeon to St. George's Hospital.

The state of simple glaucoma is essentially one of atrophy, differing from what may be called idiopathic or central atrophy in being due to pressure, and therefore in being attended by evidences of pressure which may be detected if they are carefully looked for. It also differs from idiopathic atrophy in requiring a totally different treatment; for, while the latter can be controlled, if at all, only by means which exert their influence upon the nervous centres, the former can be controlled only by the removal of the hurtful pressure in which it has its origin. The diagnosis must rest mainly upon the hardness of the eyeball, upon the fulness of the external and of the retinal veins, and upon the actual or readily induced pulsation in the latter; and in any case which admitted of *bonâ-fide* doubt, it would be proper to give the patient the benefit of that doubt by the performance of iridectomy, which, while it would be certainly harmless as against central atrophy, would probably be curative as against glaucoma.

To a practised ophthalmic surgeon the aspect of glaucoma is so characteristic that I can hardly conceive the possibility of the nature of the disease being overlooked. Even in the early stages there is something in the very tint of the congestion which at once declares the nature of the case, and which leads the feeling fingers, almost instinctively, to the surface of the upper lid. But the surgeon who is not practised in ophthalmic matters too often sees only an inflamed and painful eye. The cornea is perhaps a little steamy, and the aqueous humour turbid, but the pupil, if sluggish, is dilated, and he does not think there is iritis; so he gives a purgative, perhaps followed by an anodyne, applies two or three leeches near the margin of the orbit, and prescribes sedative lotions and rest. Unless the case was originally of the hyperacute form, a remission soon takes place, the pain decreases, and the sight improves.

It probably is not discovered, in such a case, that the eyeball is left somewhat harder than natural; and it is not thought important that the sight has not quite returned to the normal standard. After a time, longer or shorter in different cases, there is a second attack, possibly not so severe as the first, which, like the first, undergoes partial subsidence, and everybody is pleased. So the history repeats itself, until either the sight is at once extinguished by an attack more violent than its precursors, or until the patient suddenly discovers that all the successive gettings better of his eye have at last left him blind,

or nearly so. He then comes to an ophthalmic specialist, who, supposing him to be at once conscientious in the discharge of his duty to his patient, and solicitous for the reputation of a professional brother, has by no means an easy task. When one eye has been destroyed by glaucoma, the other is likely either to be already suffering from an early stage of the same affection or, at least, so to suffer before long. The ophthalmic surgeon has commonly to make the patient understand that the condition of the first eye is hopeless, although it may require an operation, or even removal, for the relief of pain. He has also to make him understand that the second eye will probably be attacked in the same way; and that then a timely operation will almost certainly arrest the disease and preserve the sight. It is very difficult for a patient to realise this from verbal description, and still more difficult for him to realise it afterwards from experience, without his realising at the same time that all the pain of his former attacks, and the loss of sight which followed them, would have been spared to him if his original medical attendant had been acquainted with the nature of the condition, and had been master of the resources of his calling. The feeling of diminished confidence which can hardly fail to be thus engendered may easily extend itself to other matters, concerning which it may be wholly without foundation; and it may thus seriously affect the reputation of an otherwise skilful and careful surgeon. An excuse which I have heard made under such circumstances, "I am not an oculist," does not come with good grace from any one who at first accepted the responsibility which he afterwards endeavours to disclaim.

The recommendation which I should like to found upon the histories of such cases is chiefly this: that every practitioner should regard the state of tension of the eyeball as something never to be forgotten or left unnoticed; and should remember that, given high tension, any great amount of improvement is a physical impossibility. It matters nothing whether the original cause of the disease was gout, or rheumatism, or neuralgia, or exposure to cold, or any of the other incidents of life to which glaucoma, like other maladies, is commonly attributed. Whatever the remote cause, the actually maintaining cause is the high tension; and as long as this high tension remains unrelieved all other treatment will only be of the smallest efficacy. In every case of apparently inflammatory eye disease, therefore, the precise morbid conditions present are of secondary importance when compared with the state of tension; and the first question of the practitioner should be: Is there here such a degree of tension as to constitute an obstacle to recovery? The palpation of the eyeball, with reference to this question, should

never be neglected; and the sound eye should in most cases be compared in this respect with that which is diseased. If these precautions were generally adopted, we should soon see no more of the embarrassing and distressing cases to which I have referred, and in which vision has been thrown away, by a vain and groundless reliance upon measures which were wholly inadequate to meet the emergency against which they were directed.

Besides the primary forms of glaucoma, there are many examples of what have been called the secondary forms of the same affection, those in which increased tension appears to have been brought about by the irritation excited by other morbid changes. There are, of course, conditions, not strictly glaucomatous, in which there is a direct increase of tension; as, for instance, in serous iritis, when there is a direct and obvious hyper-secretion; and again in intraocular cancer, in which the mere presence of the growth necessarily distends the eyeball. Serous iritis presents another point of resemblance to acute glaucoma, in that these two are the only apparently inflammatory affections of the internal eye in which the pupil is often somewhat dilated. The differential diagnosis is not difficult. In intraocular cancer the nature of the case would usually be quite evident before any symptoms resembling those of glaucoma were produced; and the growth is generally plainly visible. In serous iritis, the increase of fluid takes place chiefly into the anterior chamber, so that this chamber becomes distended, and the iris and lens are thrust back. In glaucoma an opposite condition exists. The increase of fluid occurs chiefly in the vitreous chamber, and hence the lens and iris are pushed forwards, so that the cavity of the anterior chamber is often nearly obliterated, the iris almost seeming to be in contact with the cornea.

There is perhaps hardly a single inflammatory affection of the eye in which an increase of intraocular tension does not sometimes occur, adding some of the symptoms of glaucoma, such as hardening of the eyeball, contraction of the field of vision, and arrest of the circulation, to those of the pre-existing malady; but such complications, very common in some affections, are comparatively rare in others. The condition most prone to produce secondary glaucoma is the presence of a large corneal cicatrix after ulceration, especially the cicatrix left by a perforating ulcer, and to which a portion of the iris is adherent. Some forms of inflammation of the cornea entail a liability to increased tension; but in all these states the patients are usually young, and their ocular tunics are more extensible than they become at a later period of life, so that impairment of vision is neither so soon nor so certainly produced. Neverthe-

less, if tension steadily increases, the secondary glaucoma either is, or soon becomes, of greater importance than the primary malady, and should receive the first attention of the surgeon. I have met with a few instances of primary glaucoma in early life; but in these the increasing tension has been masked by yielding of the sclerotic and elongation of the eyeball; so that the cases assumed the aspect of progressive myopia, and were only recognised by the rate of increase, and by the excavation of the optic disc which attended it.

I have already mentioned that the treatment of glaucoma, from the dawn of medical history to our own time, had been utterly without effect, or that, on the most favourable supposition, it had done no more than to retard the inevitable end. Mackenzie, in 1830, recognising the importance of the distension of the ocular tunics, had suggested and practised perforation of the sclerotic; and Middlemore, five years later followed in the same path. That their recommendations fell into oblivion is perhaps the best proof that their practice was not fruitful of results; but yet, within the last few years, it has been seriously recommended that paracentesis should be employed as an ordinary substitute for iridectomy. Soon after 1850, von Graefe, who was only twenty-three or twenty-four years old, turned his attention to glaucoma as to a malady which was the reproach of ophthalmic surgery, and commenced a series of experiments with a view to its relief. The excavation of the optic disc, then lately rendered visible by the ophthalmoscope, had given fresh significance to the heightened tension; and the discovery of a means of diminishing tension was what von Graefe proposed to himself as the goal of his researches. He made trial of many evacuant medicines, purgatives, diuretics, diaphoretics, but all without avail. The common mydriatics, atrophine, daturin, and the like, appear to diminish the tension of healthy eyes; and these were also tried without effect; von Graefe observing that their inefficacy might possibly be due to the difficulties which the hardness of the eye would place in the way of their being absorbed. The disused treatment by paracentesis was revived, and was found at the best to be productive of no more than a temporary amelioration. At last the clue was given by the observation that eyes from which a portion of iris had been excised, in order to make an artificial pupil, or for any other reason, were often permanently softened. This observation led to experiments upon animals, and it was found that the excision of a broad piece of iris from a previously healthy eye invariably produced a state of subnormal tension. The change thus wrought was not tested by palpation alone, but also by introducing the needle of a hypodermic syringe into the anterior chamber, and by observing the height to which the

aqueous humour would ascend in the barrel before the iridectomy, and again after the eye had recovered from it. The results thus obtained were sufficient to justify trials of the operation as a remedial measure upon the human subject, and in 1856 von Graefe performed his first iridectomy for the cure of glaucoma, and at once removed from the disease the burden of utter hopelessness under which it had previously lain. In 1857 his results were published to the world, and were at first met by various degrees of acceptance or of incredulity. In this country Mr. Bowman earned the gratitude alike of the profession and the public by the zeal and earnestness with which he first tested the accuracy of von Graefe's statements, and then spread abroad the glad tidings of the discovery. Nineteen years have elapsed, experience has been gained, and controversies which once raged are now wellnigh forgotten. I have not even a conjectural estimate of the number of people who have been rescued from impending blindness by iridectomy, but it is quite certain that this number must be such as to constitute von Graefe one of the greatest benefactors to the human race that the world has ever produced.

Regarded from this point of view, and putting aside a few exceptional examples, whether acute or chronic, which are still found to resist treatment, we may say, as a general rule, that in the most acute cases the operation, if performed before perception of light is lost, will nearly always restore vision to the normal standard, and will prevent a recurrence of the affection. In subacute cases it will arrest the disease, but the restoration of sight will generally be only gradual, and will often ultimately be incomplete. In chronic cases the operation will usually arrest the malady, but is comparatively seldom followed by improvement; so that it cannot be relied upon to do more than preserve the amount of vision which existed when it was performed. In these chronic cases, moreover, we sometimes find that the atrophic changes which the pressure had initiated refuse to be arrested, and that blindness, after all, closes the scene. It must not be forgotten that such conditions ought not now to be suffered to exist; and that the chronic forms of glaucoma should be detected, and submitted to operation, before the atrophy has received a sufficient impulse to be continued after its exciting cause has passed away. The reliance which we justly place upon iridectomy should not on that account make us neglectful of other remedies; for treatment which by itself would be unavailing may become extremely useful as an auxiliary, when once the predominating physical condition of extreme tension has been set aside. The state of the general health, the presence of the gouty or of any other diathesis, the state of the digestion, of the sleep, and of the

secretions, are all matters which should be carefully inquired into and regulated. In the great majority of instances, iridectomy alone will cure glaucoma; but there are yet some in which it fails to relieve the tension, and there are others in which the tension will recur. It is quite possible that, in both these classes, the resources of the physician might turn the scale in favour of the patient.—*Lancet, July* 29, 1876, *p.* 144.

71.—ON GLAUCOMA AS A NEUROSIS, WITH AN ILLUSTRATIVE CASE.

By JONATHAN HUTCHINSON, Esq., Senior Surgeon to the London Hospital; Surgeon to Moorfields Ophthalmic Hospital.

I have often and long ago indulged in the expression of a conjectural opinion that glaucoma is a neurosis, and that the immediate cause of the tension of the eyeball is tonic contraction of the sclerotic, and not any increase in the fluid contents of the organ. I have also sometimes remarked that its closest pathological analogue is the curious contraction of the palmar fascia, not unfrequently met with in middle-aged and elderly persons. Such opinions may to some seem rather fanciful; but, in spite of that defect, I feel convinced that they are worth thinking about. The contraction of the palmar fascia to which I refer is usually seen in front of the ring finger, and often involves the little finger also. It gradually and surely puckers up the skin and deeper parts a little below the finger cleft, and pulls the first phalanx down towards the palm. The skin and fascia become adherent together, but there is never any pain or inflammation. It occurs as frequently to those who do not do any work as to those who use tools, and probably has no connection with local irritation. Excepting that it sometimes happens to gouty persons, we can offer no conjecture as to any state of health which predisposes to it. It never occurs to young persons, is rare before middle age, and most frequent in early senile periods. It usually begins in one hand, and, after a while, attacks the other also. It is irremediable. In most of these features it much resembles chronic glaucoma. I admit that we have no rapid cases which might correspond with acute glaucoma; but then probably the sclerotic coat of the eye contains elements far more closely resembling non-striated muscular fibres than does the fascia of the palm. To this latter fact I would also refer, in explanation of the circumstance, that, whilst in the palmar disease there are manifest thickening and adhesion of tissues, none such have as yet been proved in glaucoma. The operative measures, iridectomy, sclerotomy, and the like, are such as would be not unlikely to be useful if the theory suggested were true, while it is somewhat difficult to explain their action under other hypotheses.

Whether we accept or not, as plausible, the sclerotic-contraction theory of glaucoma, we can, I think, feel little hesitation in admitting that both glaucoma and contraction of the palmar fascia are neurotic lesions. They are neither of them merely local, and neither has probably much to do with the blood. It is rare, in the highest degree, to find either of them synchronously symmetrical, whilst both are usually bilateral in the end. This fact fits well with what we know of some other ailments, the result of nerve-degeneration. Both occur at periods of life when such degenerations are not uncommon.

When I began this paper, I scarcely intended to say so much on this supposed parallel; my object was rather to narrate a case in which glaucoma, with unusual features, and contraction of the palmar fascia are present together, and in which there is evidence of progressive disorder of the nerve-centres. The case is one of considerable interest in many directions, though, I must admit, of much intricacy. Certain lessons may, however, I think, by those who can give attention to detail, be learned with tolerable clearness from it.

Mr. K. is an intelligent farmer, now aged 48, of a family in which nervous disorder has repeatedly shown itself. One brother has been several years in an asylum, having become insane (a harmless, quiet form) after some business anxieties. Another brother was liable to attacks of inordinate sopor, and used to sleep for several days and nights consecutively. He had several attacks of this liability, on each occasion after a very severe cold, and the last ended in death. His case has formed the subject of an able narrative by Dr. Ward Cousins, of Portsmouth, in the *Lancet*, some years ago. My patient considers that he was, when at school, a delicate lad; but, in later life, his state of nervous health was such as to enable him to be quite successful in his business. He never married; was always continent, and suffered from boyhood onwards from nocturnal emissions. He has lived a very steady life in all respects, having never either drank or smoked to the least excess. It may be noted, in passing, that three other brothers have remained unmarried, two of them being those whose cases are referred to above. The third celibate is a florid healthy man. Mr. K. himself is pale, and rather thin; but there is but little in his manner which would lead to a suspicion of sexual debility. He utterly denies masturbation. The ailments from which he has suffered may be mentioned in the following order, which is nearly that of their development.

Dyspepsia, with constipation and flatulence;
Difficulty in sleeping;
Lassitude and want of strength;
Slow development of cataract in the right eye, followed after several years by glaucoma;

Absolute blindness, and great increase of tension, with an *abnormally deep anterior chamber, and an iris which still acts vigorously when the sound eye is stimulated;*
Distressing liability to giddiness;
Contraction of the palmar fascia in the right hand;
Pain in the occiput and neck;
Feeling of stiffness and numbness in the right arm and right side of the chest;
Inability to attend to his business or exert his mind, although his mental faculties remain perfect.

Mr. K. has been under my observation, with long intervals, for the last twelve years. At first he was out of tone, dyspeptic, and "hypochondriacal"; but, by degrees, more special conditions were developed. In July of 1874, he came to me after an interval of several years, and I found that cataract had formed in the right eye. Of this I had known nothing before. He thought the eye had been ailing for five or six years. During the last three months he had experienced much pain in the eye, the severity varying much at different times. The tension was slightly increased, the cornea looked a little dull, and the iris wanted lustre. Although the pupil acted fairly to light, it dilated but very little when atropine was used. The anterior chamber was deep. The iris was thought to be a little tremulous. As the eye was blind and the failure had been slow, I did not advise an operation.

In January of 1875, I saw him again. The eye was now quite blind, but without pain. He considered that it had been blind for several years, and before the attacks of glaucomatous pain described in the previous note. The cataract was of a dirty brown colour. The increase in tension was very decided. He complained that his head symptoms had greatly increased of late. He had become more and more sleepless, and asserted that he never "could never get more than half-asleep." It appeared that his want of good rest was probably a main cause of his debility. He was frequently giddy, especially soon after rising.

I now sent him to Margate; but, whilst there, he said he felt far worse, and was so languid that he could only just get out. About this time, he insisted on leaving his farm, and going to live with a brother, alleging that he felt so weak and giddy that he was unable to attend to anything. Often in the fields he would feel as if he must fall, and be glad to lean against a gate. His dyspepsia and flatulence had never been much benefited by attention to diet. He had left off first one thing and then another, and then resumed them again, and never found that it made much difference.

In May 1876, he again called on me. He did not look any

worse, but made still greater complaint of his inability to attend to business. I now examined his eye carefully, and found its condition very peculiar. The cornea, although not actually steamy, was not bright, but looked dull, like that of a fish. Possibly, owing to the state of the cornea, the iris looked muddy. The pupil was of medium size, perhaps rather small; it was motionless when the eye was exposed to light, but acted very fairly when the other eye was exposed. The anterior chamber was much deeper than natural, the ciliary attachment of the iris being retracted. The emergent veins were rather larger, and more numerous than natural. The tension of the globe was much increased. He could barely tell light from dark. The eyeball was still at times rather painful. He had suffered for nine months from pain and stiffness in the right side of his neck, and from stiffness and numbness in the right arm and hand, and right side of chest. He could use the hand for anything, but said that he often had "to rub it to take the numbness away." The palmar fascia at the base of the ring finger was contracted and hard, and the finger was a little drawn down. In the other hand similar conditions existed, but in much slighter degree. The left eye enjoyed perfect vision, and appeared normal in all respects.

Mr. K. has never suffered much from cold feet, a symptom frequently noticed when the nervous system fails in consequence of sexual abuses. He has been liable to colds in the head, to an extreme degree, often being for months together scarcely ever without. Although very frequently giddy, and unable to exert his mind, he can walk fairly, and usually does six miles a-day. His appetite is good. His pulse is deliberate, sixty in the minute.

There can, I think, be little doubt that some central disease of his nervous system in the left side is present, by which the various right-side symptoms are to be explained. The retraction of iris and activity of pupil, with such a considerable degree of tension, are, I think, very exceptional.—*British Medical Journal, June* 17, 1876, *p.* 747.

72.—CLINICAL LECTURE ON A CASE OF GLAUCOMA.

By Dr. CHARLES BELL TAYLOR, Surgeon to the Nottingham and Midland Eye Infirmary.

There are two principal varieties of glaucoma—the simple and the inflammatory. The simple is also known as the chronic; and I have found it convenient to designate the sub-varieties of the inflammatory form of the disease by their principal distinguishing characteristics—namely, the remittent, persistent, and fulminating. They all essentially consist in intra-ocular hyper-

secretion, and consequent increased tension of the tissues or coats of the eyeball.

If the globe is put upon the stretch very slowly, as in simple glaucoma, it shows great tolerance of the process, and it is only on careful examination that we can discover what is going on. If, on the contrary, the pressure takes place suddenly, reaction is provoked, and we have the phenomena of inflammatory glaucoma, which is more or less severe according to the amount and suddenness of the augmented tension.

As a result of this loss of balance between secretion and absorption, the eyeball becomes perceptibly hard to the touch; the increased vitreous humour presses forward the lens and iris at the expense of the anterior chamber; and the sclerotic, as evidenced by cupping of the optic disc, gives way posteriorly. Hence we find, on ophthalmoscopic examination, either a saucer, or an abrupt excavation, such as I have roughly indicated in the accompanying diagrams.

Like cataract, and many other constitutional affections, the disease is symmetrical; but one eye is usually affected some time before the other. Simple (or chronic) glaucoma may last years before destroying sight, and in its early stages but slight change from the normal aspect of the eye is to be noticed. Such patients—usually past middle life, and presbyopic—are, however, addicted to a frequent change of spectacles; and as time passes on, the effect of increased pressure is shown by a sluggish or dilated pupil, from partial paralysis of the ciliary nerves, and there is also more or less engorgement of the episcleral veins. Mrs. C. complained of pain; but frequently there is no pain, and the only fact likely to be noticed by a casual observer is that the patient's sight is failing. Central vision suffers, no doubt, to some extent; but the grave defects are first and chiefly manifest in the excentric portions of the field: the patient sees as though looking through a tube which is gradually diminishing in calibre; and if a map of the field of vision is made, some encroachment from without inwards may be noted every few weeks, until at last central vision shares in the general deterioration, and total darkness closes the scene.

During the progress of the case there are often slight exacerbations, periodical obscurations, and coloured vision.

Remittent (or subacute) glaucoma is marked by exacerbations and remissions. Each exacerbation represents something gained in the direction of total blindness; and each remission is less and less complete. At the onset the eyeball is inflamed, hard, and very painful; the pupil dilated, and the cornea dull and insensitive; while the humours are so clouded that the nerve can only be seen, if at all, with the opthalmoscope—like the sun in a fog. For the same reason the patient fancies the room

is filled with smoke, and notices a coloured halo round the flame of the gas or candle. When the attack passes off, sight is restored, and the sufferer may congratulate himself on recovery; but vision is not exactly what it was before: tension is still in excess of the normal amount, and ophthalmoscopic examination reveals a certain amount of cupping of the disc and atrophy of nerve-tissue. The attacks in very exceptional cases separated by long intervals, usually recur at shorter and shorter periods, until at last, generally in a few months' time, there is no further remission, and sight is destroyed with the symptoms common to the succeeding varieties of the disease.

In the acute—or, as I have called it, persistent—form of inflammatory glaucoma, the symptoms at the outset are the same as in remittent glaucoma, but usually more severe, and are speedily aggravated from bad to worse without any interval. Vision is lost in a few weeks' time, and, in addition to other deteriorative changes the cornea gradually becomes opaque. After a time, pain ceases; all chance of restoration of sight is gone; and we ultimately find secondary cataract, with an eyeball almost as hard, and well-nigh as insensible, as a stone.

In the fulminating variety there is no warning and no remission; the patient is struck down, as it were, by a thunder-bolt. All the preceding symptoms are aggravated to the last degree; the pain is agonising, frequently accompanied by distressing vomiting, and sight is abolished in a few hours.

Thus we see that the etiology and pathology of all forms of glaucoma are the same; the essential feature being hardening of the globe from increased intra-ocular secretion, and more or less rapid destruction of the tissues involved. Simple glaucoma is consummated in a few years; sub-acute or remittent, as a rule, in a few months; acute or persistent, in a few weeks; and fulminating, in a few hours.

The varieties thus briefly described shade off into each other, crop up during the progress of other ocular diseases, and are provoked in a secondary or traumatic form by accident or injury. They all end in total darkness, and are all curable by a timely and well-performed iridectomy.

The great trouble is that patients in the early and remediable stages are very constantly under the care of practitioners who are neither familiar with the disease, nor accustomed to treat it by the only remedy—operation. Thus we find that simple glaucoma is very commonly mistaken for cataract; the acute and remittent forms for iritis, sclerotitis, rheumatic, syphilitic, or other inflammatory affection of the eyeball; while fulminating glaucoma is either diagnosed as "a most extraordinary case of neuralgia," or the symptoms are attributed to inflammation of the brain or its meninges. As a consequence of this

false diagnosis, we have the most disastrous results: patients suffering from simple glaucoma are told, under the impression that cataracts ought to be mature, that they will best consult their own interests by waiting until blindness is complete. The inflammatory forms are, with a view of preventing adhesions of the iris, most seriously, even hopelessly, aggravated by the instillation of atropine; while in fulminating glaucoma both the patient's blindness and the real *fons et origo mali* are swallowed up in the magnitude of the constitutional symptoms, and the ocular disease overlooked until the period for beneficial treatment is gone by.

Let me illustrate these remarks.

Some years ago I was told by a surgeon of great experience, whom I met accidentally, that I should shortly be required to operate upon a lady patient of his for cataract, but that, although her sight was already very dim, the case was not as yet sufficiently advanced to warrant extraction. Subsequently one of the patient's friends applied to me in a casual way with a similar history, and I was told that two surgeons and two physicians, resident elsewhere, had in the meantime been consulted; that these gentlemen concurred in the diagnosis, and recommended delay. Two years from the date of my first interview with the family attendant I was called in to operate, and for the first time saw the patient, when I found the pupils widely dilated, the eyeballs stony-hard, the media clear, the optic disc deeply cupped in both eyes, and sight reduced to bare perception of light. To the naked eye there was a deceptive appearance of opacity in the fundus oculi, but the lens was quite transparent, although I had difficulty in persuading the patient's medical advisers that it would be useless to perform extraction. Here was a typical case of simple glaucoma mistaken for cataract, and sacrificed from neglect of early operative interference. Scarcely a week passes without the admission of similar cases to one or other of our special institutions, both in the metropolis and elsewhere. Here is a poor woman, whom I now introduce for illustration, who was sent to me last week from Hull, quite blind—*i.e.*, without the slightest perception of light—from simple glaucoma, the disease having been diagnosed as cataract complicated with cerebral affection. Indeed, I am not exaggerating when I say that similar incidents are distressingly common. Such cases, I must confess, are often difficult of diagnosis unless we use the ophthalmoscope; and without that instrument we should often be at a loss—a fact well illustrated by a case quoted by Mr. Jonathan Hutchinson, which occurred in the pre-ophthalmoscopic period, and regarding which the following eminent ophthalmic surgeons expressed doubtful opinions: Mr. Guthrie said: "Your disease exists in

the brain or its membranes; there is no cataract." Mr. Lawrence: "There is a loss of transparency, which may be in the lens." Mr. Alexander: "I see no cataract or want of transparency in the tissues of the eye." Mr. Travers: "I fear it is not cataract, though it may be so." This case was probably one of simple glaucoma in an early stage, similar to the one which has formed the text of these remarks; and it is not to be wondered at, when men like these were obliged to hesitate and conjecture, simply because the ophthalmoscope was not then discovered, that doubt and uncertainty should prevail among practitioners of the present day who are not familiar with that instrument.

We thus see that the differential diagnosis of a case of simple glaucoma from one of cataract is not quite so simple a matter as one would, *à priori*, suppose. It is still less surprising to find cases of remittent or acute glaucoma mistaken for iritis or other inflammatory affection of the eyeball. Indeed, the practitioner is here placed in an awkward dilemma. If the patient is suffering from iritis, and the attendant neglects atropine, he is responsible for an occluded pupil; if the case is one of glaucoma, and he employs atropine, the disease is sure to be intensely aggravated—an observation which, I may remark *en passant*, applies with equal force to cases of simple glaucoma. Inflammatory affections of the eyeball in which the destructive element of increased tension is overlooked are almost as numerous as the cases themselves. Of eighty-four cases of inflammatory glaucoma of which I have notes, extending over some years, upwards of sixty had suffered irreparable damage from delay, and in very few of these had there been the least suspicion of the nature of the disease.

Only last week I was called to see a lady who had lost both eyes from acute or persistent inflammatory glaucoma. She had been under treatment for three months, and had suffered intense pain, sufficient at times to elicit moans and cries; while the intolerance of light was so great that she habitually rested on her hands and knees, with her face buried in the pillow. Two surgeons of repute had attended her; all sorts of drugs and expedients, including the abstraction of several teeth, had been adopted to relieve "the neuralgia," as it was called; and the friends were assured that "when she was able to bear the light, and get stronger, her sight would be restored." The suggestion of further advice was deprecated as unnecessary, and the patient allowed to go blind with the very best intentions.

Last year two similar cases of the fulminating variety came under my notice. In both the ocular affection was either overlooked, or regarded as secondary to disease of the brain or its membranes, by the physicians and surgeons who had been

called in; and in both the time for beneficial treatment had been allowed to go by.

Such cases are bad in every aspect: the patient is simply sacrificed; the family attendant loses the confidence of his patients; and the unpleasant feeling constantly provoked by the actual presence of the blind person never dies out; the ophthalmic surgeon is intensely chagrined to find that the opportunity for the most brilliant exercise of his art has passed away, though he may still relieve pain by sclerotomy or iridectomy; and the friends are called upon to pay heavy fees for a prolonged attendance, which, as they shrewdly suspect, has been worse than nothing!

It is now nearly twenty years since Von Graefe's brilliant discovery of a remedy for this terrible disease. Ever since the date of the first announcement of that discovery, ophthalmic surgeons have been calling attention to these sadly maltreated cases; and, to say the least, it is now high time that the opprobrium of their constant recurrence was swept away from the records of our noble profession.—*Medical Times and Gazette, July* 22, 1876, *p.* 83.

73.—ON UNDETECTED GLAUCOMA.

By C. HIGGENS, Esq., Assistant Ophthalmic Surgeon to Guy's Hospital.

Perhaps the most common cause of preventable blindness, and certainly that to which the term most justly applies, is undetected glaucoma.

Two forms of glaucoma are commonly met with—the simple and the inflammatory, the latter being divided into acute and chronic.

Glaucoma, speaking generally, is an affection characterised by increase of intra-ocular tension accompanied by gradual or rapid failure of vision, and followed if no relief be given by atrophic changes in the structure of the globe. Of the causes of glaucoma we know but little; it may result from injury, or be secondary to inflammatory changes in some of the ocular structures, as keratitis, choroido-iritis, &c.; or may be set up by the dragging and irritation caused by anterior or even posterior synechiæ; a swollen crystalline lens may also be a very fertile source of the glaucomatous change. Glaucoma arising from any of the above causes is known as "secondary."

But as a rule the disease comes on without apparent cause; it usually attacks persons past the middle period of life, but may occur in young adults or even in children; in the last, however, it is usually secondary. Of the treatment we know a good deal, but only empirically, as we are totally ignorant of the modus operandi of the measures taken for cure.

The simple form of glaucoma is that which we have principally to consider in the present paper, as it is the most frequently undetected; but it will be shown by notes of two cases that the chronic, and even the acute forms may be allowed to destroy sight, without the true nature of the disease being recognised, or the proper treatment adopted.

Simple glaucoma is in its onset as well as in its progress most insidious, and may go on for years before sight has become so much affected as to lead the patient to seek advice. Moreover, it attacks almost exclusively persons considerably beyond the middle period of life, who are only too ready to attribute their failure of vision to natural senile changes.

The symptoms are very gradual—failure of sight, with perhaps at times the appearance of coloured mists, and other obscurations of the visual field, tinted haloes around a flame, and abnormal increase of presbyopia.

On examination we find the pupil somewhat dilated and sluggish, the tension of the globe increased, the field of vision narrowed, more especially on its nasal side, the anterior chamber diminished in depth, the cornea somewhat flattened, and its sensation diminished, and the lens apparently hazy.

The ophthalmoscope shows some hyperæmia or cupping of the optic disc, and very possibly spontaneous or easily produced pulsation of the retinal arteries. Attacks of pain and inflammation do not occur.

Simple glaucoma may be, and frequently is, overlooked, the symptoms and naked-eye appearances being somewhat similar to those of senile cataract, for which it is not unfrequently mistaken.

A patient suffering from simple glaucoma, when at length he has become satisfied that vision is failing in an abnormal degree, consults his usual medical attendant, who will very probably not recognise the disease, but on the contrary may mistake the case for one of cataract.

The diagnosis of cataract having been made, the patient is advised to wait till it is ripe, when he can have it extracted. The patient goes on getting blinder and blinder, until the sight of one, or very possibly of both eyes, is reduced to perception of light, or even until perception of light is entirely lost. The cataract is now considered ripe, and either extraction is performed by the medical attendant (only to the bitter disappointment of both patient and operator), or the advice of an ophthalmic surgeon is sought, and what does he find? Very possibly opaque lenses, steamy, anæsthetic, and flattened corneæ, dilated, fixed pupils, shallow anterior chambers, large tortuous veins upon the surface of the sclerotic, rotten conjunctiva, and stony hard globes perfectly insensitive to light,

the condition known as absolute glaucoma being developed; or more probably, on *using the ophthalmoscope*, the cataract is found to be a delusion, there being simply some slight nuclear opacity; but the optic discs are found deeply cupped, and, together with the retina, in a condition of atrophy. The tension of the globes is above par, and all vision hopelessly lost, and simply because the true nature of the disease was not early recognised and a timely iridectomy performed.

The treatment of glaucoma is entirely operative, and so soon as the nature of the disease is manifest, we must insist on operative interference. To give medicines, use lotions, blisters, leeches, &c., is simply to procrastinate and lose valuable time, and lessen our patient's chance of recovering useful vision.

The operations which have been most generally practised for glaucoma are iridectomy, paracentesis of the anterior chamber, divisions of the ciliary region, and sclerotomy. Our object in performing any of these is to reduce the tension of the globe, and unless a marked decrease in this respect follows the operation, it has failed to do that which was intended, and hence it must be repeated.

The operation of iridectomy is that which holds the foremost place as a means of reducing intra-ocular tension. Certain precautions must be taken in performing the operation, otherwise no good results will follow. We must bear in mind that simply cutting out a piece of iris is not all that is required. I have seen many cases in which iridectomy was said to have failed—where only the sphincter of the pupil had been removed, or perhaps a very narrow piece of iris, which, however, extended across its whole breadth, had been excised; the operation thus performed does little or no good. In performing iridectomy for the relief of intra-ocular tension we must be careful *to excise a broad piece of iris, extending from the pupil down to the ciliary attachment.* The position of the portion of iris removed is of no moment so far as reduction of tension is concerned, but disfigurement is avoided if the gap be made upwards, as it is then covered by the upper lid.

Nevertheless, I would advise the inexperienced operator to make his incision just external to the lower and outer margin of the cornea, and remove the corresponding portion of iris; the ease and safety with which the iridectomy can be made in this direction quite counterbalance any objections that may be made on the score of disfigurement. If the tension of the globe is not materially and permanently reduced by a single iridectomy, we must perform a second—preferably—in a direction opposite to the first; and if tension should then remain above par, the remainder of the iris should be removed.

Tapping the anterior chamber is, I think, simply playing with the patient, and those surgeons who recommend it allow that the operation must be done repeatedly to be of service. I have tried it, but have seen no permanent good result from it.

Of division of the ciliary region I have had no experience, but look upon both it and sclerotomy as directly opposed to all our notions respecting accidental wounds of the eyeball, those in the ciliary region being always looked upon as fraught with the greatest danger to the injured eye, and as being more likely than wounds in any other situation to cause sympathetic ophthalmia. I have performed sclerotomy in a number of cases, but my experience of the operation is not such that I can recommend it. Its efficiency in reducing tension cannot be doubted, but I do not know that it is superior to iridectomy; in two cases which have been under my care, in one of which a single eye had been sclerotomised by Mr. Bader, in the other by myself, the second eye was lost from sympathetic ophthalmia. I excised the sclerotomised eyes, and performed iridectomy in the sympathetically affected ones, but the patients lost all useful vision.

It is in cases of acute glaucoma that the most marked results are obtained by operation; many patients who were to all intents and purposes blind have had almost perfect vision restored. In the chronic cases considerable improvement takes place if operative interference has not been too long delayed. In simple glaucoma the result of an operation is not very satisfactory; the disease is stayed, but no improvement takes place, and unfortunately in by far the greater number of cases we see, the morbid process has been allowed to go on till the power of vision has been very materially reduced, or total blindness has been developed. What we have to bear in mind in all cases of glaucoma is, *that the earlier an operation is performed for its relief the greater is the chance of a successful issue.*—*Guy's Hospital Reports*, 1876, *p.* 200.

74.—TREPHINING THE SCLEROTIC—A NEW OPERATION FOR GLAUCOMA.

By Dr. D. ARGYLL ROBERTSON, F.R.S.E., Ophthalmic Surgeon to the Royal Infirmary, Edinburgh.

Ophthalmic surgeons at the present day generally agree in viewing the symptoms present in most cases of glaucoma as dependent upon increased intra-ocular pressure. How this increase of tension is produced, whether by augmented secretion of vitreous humour, by serous transudation or inflammatory exudation into the chamber of the vitreous humour, by altera-

tion in the structure of the sclerotic, or by other pathological states, has not yet been satisfactorily determined. It is not my object in this paper to discuss these points, although personally I incline to the view that the increased tension is due in some cases to increased secretion of vitreous humour, in others to serous transudation into the chamber of the vitreous humour. All the other symptoms of the disease, including the impairment or loss of vision, can readily be explained by the pressure to which all the structures in the interior of the eye that lie between the vitreous humour on the one hand, and the resisting sclerotic and cornea on the other, are subjected. All measures, therefore, that are undertaken for the cure of this disease, have for their object the reduction of the increased intra-ocular pressure.

The following are the operations that have hitherto been practised for the alleviation or cure of glaucoma. 1st, paracentesis of the cornea; 2nd, incisions into the chamber of the vitreous humour (known as "division of the ciliary muscle" and "intra-ocular myotomy"); and 3rd, iridectomy.

Paracentesis of the cornea is by far the simplest procedure, and is attended with considerable benefit, but unfortunately, as was pointed out by Von Graefe, its effect is only temporary, each successive evacuation of aqueous humour producing less and less benefit, so that this method has been almost entirely abandoned.

The operation of division of the ciliary muscle, or intra-ocular myotomy, has undoubtedly a very marked effect in reducing the tension of the eye, and although the benefits arising from the operation have been attributed by the gentleman who proposed it to a division of the ciliary muscle, I am more inclined to consider the evacuation of a small quantity of the humours of the globe and the presence of an aperture in the resisting coat of the eye as the main factors in bringing about that result. This operation never obtained very general favour, and has of late fallen much into disuse, chiefly I believe on account of the temporary character of the benefit following it, and also partly from the liability of all wounds in the ciliary region to be followed by chronic insidious cyclitis leading to loss of vision in that eye, and even by sympathetic ophthalmia in the neighouring eye.

Thus it happens that at the present time iridectomy is the prevailing remedy for all glaucomatous affections, and should the removal of one portion of iris fail to produce the desired effect, the only further measure to be resorted to is the excision of another piece. In many cases of glaucoma iridectomy is undoubtedly followed by excellent effects, and I would be the last to decry its application in suitable cases, but it must accord with

the experience of most oculists that there are occasionally cases in which the iridectomy, owing to extensive adhesions between the iris and capsule of the lens, or degenerative changes in the structure of the iris itself, cannot be effected, and others in which that operation instead of benefiting seems almost to aggravate the disease.

It is in these classes of cases particularly that some other means besides iridectomy of permanently reducing the tension of the eye, and thus allaying the severe pain that accompanies these affections, and even restoring some vision, or at any rate retaining the vision that remains, is desiderated. This I imagine I have succeeded in obtaining by the operation of trephining the sclerotic, whereby a circular aperture about $\frac{1}{15}$ of an inch in diameter, is drilled through that membrane, permitting the escape of some of the superabundant fluid in the chamber of the vitreous humour. This of course at once reduces the intra-ocular tension, but I further believe the reduction in tension thus produced is likely to be of a permanent character, as the circular opening in the sclerotic must be filled up by new tissue which is of less firm texture than the original sclerotic, and will thus readily yield to any pressure from within, and act the part of a safety valve should the contents of the vitreous chamber be at any future time again increased in amount.

The point I have hitherto chosen for perforating the sclerotic is at or about the junction of the ciliary processes with the choroid, so as to avoid as far as possible the more anterior parts of the ciliary processes, injury of which experience has shown is apt to produce insidious inflammatory and degenerative changes. The instrument with which I have in all cases as yet performed the operation is the corneal trephine devised by Mr. Bowman for operating on cases of conical cornea; but I found that it was not in all respects well adapted for perforating the sclerotic, and have therefore had a similar instrument made with certain modifications. I found that with Mr. Bowman's instrument it was very difficult to recognise when perforation was effected if the central brass rod was left in the cylinder ,and if this central brass rod were removed before trephining, that a considerable quantity of vitreous humour was necessarily ejected through the cylinder whenever the coats were perforated, owing to the amount of pressure necessary to force the tapering cutting extremity of the cylinder through the thickness of the sclerotic. I further found that the smooth surface of the narrow cylinder did not afford the fingers a firm grasp during the necessary rotatory movements. I therefore had an instrument made by Messrs. Weiss and Son, consisting of a steel cylinder, the cutting extremity of which for the length of $\frac{1}{15}$ of an inch was made very thin, the other

extremity of the cylinder, to the extent of fully ¼ an inch, being surrounded by a ring of german silver roughened on its outer surface so as to afford a good hold for the fingers. The alteration in the cutting extremity is to enable perforation to be more readily effected, while the projecting shoulder prevents the instrument passing too far into the interior of the eye. When not in use there is a cap to fit over the cutting end of the cylinder to prevent it being injured.—*Ophthalmic Hospital Reports, May* 1876, *p.* 404.

75.—SCLEROTOMY *VERSUS* IRIDECTOMY.

By C. BADER, Esq., Ophthalmic Surgeon to Guy's Hospital.

The object of the operation of sclerotomy is to relieve abnormal tension of the eyeball by an incision through the sclerotic, close in front of the insertion of the iris. A permanent communication between the aqueous chambers and the subconjunctival space adjoining the sclerotic wound is the desired result.

I have performed sclerotomy for the last three years, in many cases in which iridectomy, and in some, in which excision of the eyeball, would have been practised by others.

The result has been a gradual decrease of the number of iridectomies, with a proportionate increase of sclerotomies; especially in grave cases of glaucoma, in which iridectomy would have been surrounded by great difficulties, or in which it might have been followed by loss of vitreous, &c.

The Operation.—Most of the patients were operated upon while under the anæsthetic (alcohol, ether, and chloroform), though very unfavourable cases of glaucoma were successfully sclerotomised without an anæsthetic.

The patient is placed as for iridectomy; the eyelids are kept open with the spring speculum until the completion of the operation; the eyeball is fixed with the screw fixer near the lower margin of the cornea; the fixation is continued until the sclerotic incision is completed. For the right eye a Graefe's knife, for the left a bent cataract knife is used; thus, standing behind the patient, both eyes can be sclerotomised with the right hand.

To make the sclerotic incision the knife is thrust through conjunctiva and sclerotic into the aqueous chamber as near as possible to and in front of the insertion of the iris, is carried across the aqueous chamber without sparing the iris should it interfere with the course of the knife, and is again thrust out through the sclerotic and conjunctiva (as near as possible to and in front of the insertion of the iris). Having thus made the puncture and counterpuncture, the incision through the sclero-

tic is completed (in the same manner as is usual when making a corneal flap for the extraction of cataract) slowly, especially when near completion, so that the knife escapes from the sclerotic beneath the conjunctiva without any jerk. Having reached the conjunctiva, the blade is placed flat upon the outer surface of the sclerotic, the cutting edge directed backwards, and while slowly withdrawing the knife from beneath the conjunctiva some of the latter is separated from the sclerotic.

As large a bridge of conjunctiva as possible should be left, stretching across the sclerotic incision. It is beneath this conjunctiva that the aqueous humour escapes; the iris sometimes protrudes, &c. The extent of sclerotic to be divided is equal to nearly a third of the circumference of the cornea, forming a sclerotic flap, similar in size and shape to a small corneal flap, as used to be made for extraction of a small hard cataract.

Sclerotomy has been performed in different directions; it gives least trouble when made along the upper margin of the cornea.

When made behind the iris, or from before backwards through the ciliary muscle, it may be followed by shrinking of the eyeball.

Immediate relief of tension in the most hopeless cases of glaucoma has been the usual result of the operation.

The after treatment as to binding up, using the eyes, &c., is the same as after iridectomy.

The only troublesome sequel of the operation has been the occasional occurrence of much bulging (staphyloma) of the conjunctiva, which may become so troublesome as to require operative treatment. It should be borne in mind, that the staphyloma is not one of sclerotic, but of conjunctiva, or of conjunctiva and iris only.

P.S.—In five cases of sclerotomy, followed by large conjunctival staphyloma, or so-called hemorrhagic glaucomatous eyes (high tension, great vascularity of tissues, much blood in vitreous chamber), a very satisfactory result was obtained by the frequent application of linseed-meal poultices. The pain, redness, and staphyloma rapidly subsided: the eye, apparently doomed to excision, assumed a healthy appearance, the tension sinking below par.—*Ophthalmic Hospital Reports, May* 1876, *p.* 430.

76.—ON GRANULAR OPHTHALMIA.

By C. Higgens, Esq., Assistant Ophthalmic Surgeon to Guy's Hospital.

Granular ophthalmia affects principally the lower classes, and is often very prevalent where large numbers of persons are

crowded together in workhouses, schools, barracks, &c. The causes of the disease are not altogether plain, but it would appear that in persons who have lived for some considerable time under unfavourable hygienic conditions, a peculiar granular state of the palpebral conjunctiva becomes developed. Persons thus affected are said to be predisposed to granular ophthalmia. The predisposed eyelid is characterised by the existence of small, pale, more or less spherical bodies, situated in the structure of the conjunctiva; these little bodies much resemble, and are known as, sago grains. They will be found best developed and most constantly present on the inner surface of the lower lid, near the outer canthus. They may, however, be scattered over the whole surface of both the lower and upper lids, but are always most abundant in the position indicated.

[The disease is most obstinate, but in many cases will yield at length to treatment, no signs of its previous existence remaining behind.]

The remedies which have been found most useful are astringents and mild caustics. Strong caustics should never be employed: it is easy to get rid of the granulations by their use, but the conjunctiva is also destroyed, and is replaced by dense cicatricial tissue, which by its contraction causes the shrinking of the conjunctiva, and other evils. The worst examples of entropion, symblepharon, narrowing of the palpebral aperture, &c., that have come under my notice (with the exception of those caused by burns), have been in old cases of granular ophthalmia, which had been treated by solid nitrate of silver. The treatment of granular ophthalmia adopted amongst our out-patients is as follows:—In the more recent cases the palpebral conjunctiva is twice a week touched lightly all over with the mitigated nitrate of silver stick (one part of nitrate of silver to three of nitrate of potash); after the application the conjunctiva is washed with a solution of salt and water. In the more chronic cases the greenstone (lapis divinus) is used instead of the nitrate of silver.

In most cases sulphate of copper drops (cupri sulph., gr. ij, aquæ ʒj) are ordered to be dropped into the eyes three times a day or oftener. If there be much intolerance of light or symptoms of iritis exist, gr. ½ or gr. j. of sulphate of atropine is added to each ounce of the sulphate of copper drops.

If there be copious purulent discharge alum lotion (gr. x. to ʒj) is ordered in lieu of the sulphate of copper drops.

If extensive ulceration of the cornea exist the eye is ordered to be kept bandaged with lint soaked in belladonna lotion, and a fomentation of belladonna, or poppies, to be used at intervals; the granulations are neglected until the more severe symptoms have subsided.

In some severe cases inoculation with pus from a case of purulent ophthalmia is performed, but such cases are always treated as in-patients.

Inoculation is only applicable to cases in which there is dense pannus; if the cornea be healthy, or only slightly affected, it is very liable to slough during the course of the induced purulent ophthalmia.

Inoculation is best performed by simply transferring some of the pus from a recent case of ophthalmia neonatorum to the conjunctiva of the person whom it is desired to inoculate. Purulent ophthalmia usually sets in in the course of twenty-four or thirty-six hours, and may be left to run its course without treatment. The granulations always disappear, and the cornea clears gradually, improvement often going on for three or four years after inoculation has been practised. If it is deemed advisable to inoculate in a case where one eye is healthy, the greatest care must be taken to shield the sound from contact of discharge.

The treatment of granular ophthalmia, especially amongst hospital out-patients, is most unsatisfactory. Some cases are permanently cured, many get better and then cease to attend, returning in a few weeks or months as bad as ever; others again continue under treatment for months and years, all our efforts only serving to keep the disease in check. Even this, however, is doing a good deal, for such cases without treatment, or if treated improperly, will go on from bad to worse, and eventually lose all useful vision; we must, therefore, persevere with our treatment in spite of the want of success attending it. In some cases I have seen a cure effected after two or three years or more of constant treatment; a favorable change takes place almost suddenly, the granulations begin to disappear, and are replaced by smooth shining tissue, which can hardly be looked upon as healthy conjunctiva, but nevertheless forms a very efficient substitute. The following case is a good instance of such a recovery.

A soldier, who had contracted granular ophthalmia in India, some years before, came under my care in 1870 at the Central London Ophthalmic Hospital. He had been treated off and on during the whole time that his eyes had been affected, and with the exception of inoculation had had almost every known remedy tried. When I first saw him the palpebral conjunctiva, especially that lining the upper lids, was infiltrated, swollen, and covered with large rough vascular granulations, consisting principally of masses of hypertrophied papillæ, separated by deep sulci; both corneæ were covered by dense pannus; he could hardly see to go about.

I treated him for about three years without apparent result;

but at the end of that time a change took place, the granulations rapidly disappeared, the swelling and vascularity subsided, the pannus gradually wore away, and at the end of a comparatively short time all that was left of the disease was some scarring of the surface of the lids, slight shallowing of the sulcus between the lids and globe, and slight opacity of the cornea.

During the time this patient was under my care he was treated with every kind of astringent lotion,—applications of greenstone, mitigated nitrate of silver stick, solutions of the salt of strengths varying from ten to forty grains to the ounce of water, dusting of calomel and quinine into the eyes, constant poultices; in short, everything was tried except inoculation.

At the time recovery commenced he was having a solution, gr. xx to ℥j, of nitrate of silver applied daily; which treatment was continued until all trace of granulations had disappeared.

The treatment of the sequelæ of granular ophthalmia is entirely operative, and would take too much space to be entered into here; suffice it to say that our object must be to protect the cornea, when exposed, and to guard it from irritation by the removal of foreign bodies, cure of entropion, &c. And in cases where a permanent opacity has formed in front of the pupil a new one must be made behind a transparent portion of cornea. —*Guy's Hospital Reports*, 1876, *p.* 180.

77.—ON PURULENT OPHTHALMIA.

By C. Higgens, Esq. Assistant Ophthalmic Surgeon to Guy's Hospital.

Purulent ophthalmia, more especially that form of the disease met with in newly born children (ophthalmia neonatorum), is a very frequent cause of loss of sight.

Amongst hospital out-patients we often see children in whom the positions of the corneæ are occupied by dead white globular staphylomata, vision being reduced to perception of light. This condition is usually brought about by destruction of the corneæ from extensive ulceration or wholesale sloughing during the course of purulent ophthalmia. The projection (or staphyloma) is formed by the iris, which has pressed forward into the opening left by destruction of the cornea, subsequently become coated with lymph, and at length formed a more or less dense cicatrix.

I have no hesitation in saying that this state of things might in many cases be prevented. Besides the extreme cases just mentioned, we may find vision impaired by corneal opacities, opacities on the lens capsule, corneal opacity with anterior

synechia, or small staphylomata, all arising from the same cause; these, however, are not so important, as the loss of sight is only partial, and very good vision may be obtained by operation.

The causes of ophthalmia neonatorum are, contact of acrid vaginal secretions during parturition, want of cleanliness after birth, or a combination of the two, assisted by bad air aud bad living. The secretion of all others most certain to cause purulent ophthalmia, and that in its severest form, is gonorrhœal matter; but leucorrhœal discharge, or even the irritation of dust and dirt after birth, without contact of abnormal secretion may cause the disease.

I may here correct what appears to be a very common error, viz. to suppose that all purulent ophthalmia is caused by contact of gonorrhœal matter. Such is not the case, and by far the greater number of cases arising either in the newly born or in older persons owe their origin to other causes. Gonorrhœal ophthalmia is purulent, but purulent ophthalmia is not necessarily gonorrhœal.

The symptoms of ophthalmia neonatorum are obvious enough; the lids are swollen, dusky red in colour, and there is copious yellow discharge issuing from between them, which may escape in gushes on an attempt being made to open the eyes. As previously stated, the great danger to sight is from ulceration or sloughing of the cornea, either of which—if proper treatment be early adopted—should occur but rarely. In many cases the disastrous results of ophthalmia neonatorum are due to neglect on the part of nurses or mothers, who take no particular notice of the state of the child's eyes until the discharge has become very profuse. Advice is then sought, and very probably the cornea is found opaque, deeply ulcerated, sloughing or suppurating, or very possibly perforation may have already taken place. Occasionally part of the contents of the globe have escaped; it has happened to me on two occasions to have the crystalline lens brought in a piece of paper, with the report that the nurse thought the sight had come out.

In other cases again, the medical attendant is to blame; his attention is called to the condition of the infant's eyes, but he looks upon it as a trivial matter, prescribes warm water, and perhaps does not see the child again for two or three days; by this time, however, there is no mistaking the nature of the disease, and very probably permanent damage has been done to the cornea.

Again, when the nature of the disease has been indicated, and a plan of treatment prescribed, the attendants cannot be persuaded to carry it out thoroughly and the child is allowed

to go blind simply from wilful neglect on the part of its nurse or mother.

In some cases, however, the inflammation is so violent from the first that damage will be done to the cornea in spite of treatment early commenced and carefully carried out; but such severe examples are rarely met with.

It may appear at first sight that in such an active and violent inflammation as purulent ophthalmia (especially the gonorrhœal form) depletory measures should be adopted. Experience, however, shows that an opposite course should be taken.

I have yet to meet with a case in which I would have recourse to general bloodletting, purgatives, antimonials, &c. Patients who are naturally strong and healthy, when they seek advice and treatment for severe purulent ophthalmia, are as a rule too much depressed to bear anything of the sort. I occasionally order a few leeches to the temples in very violent cases, especially if pain be a prominent symptom, but never do more in the way of depletion.

The objects we have to keep in view in the treatment of this disease are to check the inflammation, and at the same time to guard most jealously the vitality of the cornea; we should therefore avoid all remedies calculated to lower the patient's powers, and employ those which have an opposite tendency.

In mild cases of purulent ophthalmia the frequent use of alum or other astringent lotion will suffice for a cure. The lotion should be used as frequently as may be necessary to keep the eyes free from discharge—every two hours, hourly, or oftener according to circumstances; care must be taken to apply the lotion to the conjunctiva and not simply to the skin of the lids and face.

Some simple ointment should be applied at night to the edges of the eyelids and skin of the cheek, to prevent the former from sticking together during sleep, and the latter from becoming excoriated.

In the more severe cases a much more energetic plan of treatment must be followed.

The plan I adopt is as follows:—When the patient first applies, the conjunctiva, both palpebral and ocular, is cauterised thoroughly with solid nitrate of silver, then washed with salt and water; the eye is then lightly covered with a piece of wet lint, fixed to the forehead with a turn of bandage, and allowed to hang over the eye.

The patient (if treated as an out-patient) is directed to sit at home and constantly bathe the eye with alum lotion (gr. x to ℥j).

Some simple ointment is ordered to be applied to the lids and cheek. If there is much pain three or four leeches are ordered to be applied to the temples.

Quinine or iron, or both, are prescribed, and the patient directed to live well and take a fair amount of stimulant; if sleep is impossible, opium is given at night.

Should the cornea be damaged the eye is kept bound up with a pad of lint soaked in belladonna lotion and a bandage, which are removed and the alum lotion applied as often as discharge collects.

The patient is seen in two days, and if not improved the nitrate of silver is again applied; if improvement have taken place the patient is ordered to go on with the alum lotion and medicine, and the nitrate of silver is omitted.

In all cases where one eye alone is affected the sound one is carefully shielded with pad and bandage, and the patient directed to sleep on the affected side, so as not to allow the discharge to run over to the sound eye.

The treatment is perseveringly carried out until manifest improvement has taken place, when the lotion may be used less frequently; but its use must not be entirely discontinued until all discharge has disappeared.

In cases where corneal damage has taken place the eye is kept firmly bandaged until cicatrisation is complete.—*Guy's Hospital Reports*, 1876, *p.* 190.

AFFECTIONS OF THE SKIN.

78.—A NEW METHOD OF PERFORMING PLASTIC OPERATIONS.

By Dr. J. R. WOLFE, Surgeon to the Glasgow Ophthalmic Institution; Lecturer on Ophthalmic Surgery in Anderson's University.

[The two cases related consist in the formation of eyelids. One operation was performed a week before this paper was written, the other eight months before.]

The original rule laid down by Tagliacozzi, and which has ever since been considered as the primary law in such cases, and the *sine quâ non* to the success of the operation, is that the flap must retain its connection with the adjacent living structure by a pedicle, which is to be severed only after complete union and cicatrisation of the raw surfaces. Many years ago, however, it occurred to me, while studying plastic operations in La Charité, in Paris, under Velpeau, that this rule is in many cases inapplicable. The pedicle has, in my opinion, been a source of great embarrassment to surgeons, and the constant employment of it has tended rather to retard than advance the progress of plastic surgery. In studying partially successful cases, I have noticed that those cases which run a critical course begin to exude a serous bloody discharge about the

second or third day, and that this is followed by suppuration, just as if an effort were being made by the flap to get rid of the binding tissue previous to adhering.

M. Reverdin's system of skin-grafting, so valuable for healing up ulcers, has led me a step further in the same direction. In attempting to supply the loss of conjunctival substance, I have, in the first instance, filled up deficiencies by shifting portions of the conjunctiva from one spot to another, without keeping a pedicle, which I considered rather an obstacle than otherwise. I then carried the principle further, and supplied conjunctival deficiencies by transplanting portions of conjunctiva from the rabbit to the human subject. In applying this principle to the filling up of cutaneous deficiencies, I have come to the conclusion that, if we wish a skin-flap to adhere to a new surface by the first intention or by agglutination, we must be sure that it is completely cleared of all areolar tissue, and properly fixed in its new place.

The following cases will illustrate my procedure:—

Case 1.—*Formation of Lower Eyelid with Skin from the Forearm.*—G. T., miner, aged thirty-five, had his face and both eyelids burned by an explosion of gas four months ago, thereby producing eversion of both eyelids. The right eyelid was slightly everted, while the left lower eyelid was completely dragged downwards and inwards towards the nose—so much so that there was hardly a vestige of lower eyelid left, and the eyeball was thus exposed, thereby tending to inflame and ulcerate. To remedy this I proceeded in the following manner:—I vivified the upper and lower eyelids at the expense of their inner margin, keeping clear of the eyelashes. I then introduced four ligatures through the lower eyelid; these, along with the needles, I entrusted to my assistant, who, by means of them, used slight traction, so as to put the eyelid on the stretch. I then made a long horizontal incision into the skin two lines from the eyelashes, so as to permit the eyelid to be raised, but leaving the contracted skin all round; the skin was thus not wasted or cut away, but was dissected all round, and served as a frame into which

FIG. 1.

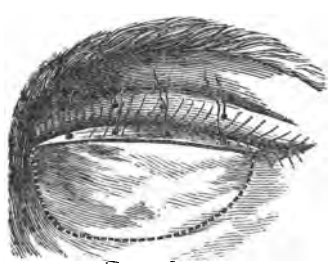


Fig. 1 shows the state of the lower eyelid, with the ligatures through border of upper and lower eyelids, and also the skin deficiency to be supplied.

the new flap was to be set or inserted. The hardened cicatricial subcutaneous tissue, however, was cleared away, and a clean surface produced. I then passed the ligatures through the upper eyelid and tied them. In this way the whole extent of the gap was exposed, and it was plainly seen how much fresh skin was requisite to fill it up. I then measured the size of the flap wanted, which in this case was two inches long, and nearly one inch broad. I removed the flap required from the forearm, and turned up the deep surface, and with a knife shaved off the subcutaneous tissue, so as to produce a clean white surface. (A small microscopic section-knife is best suited for that purpose; two of these should be at hand, as the binding tissue very soon deprives the knife of its edge.) When using the knife, the flap must be supported underneath by the middle-finger in order to feel the depth of the section. After having it properly cleared, and the whole surface white, I applied it to the gap, and so set it that the old cicatricial skin covered its edges all round like a frame, thus answering the purpose of stitches. The surface was covered with fine gutta-percha tissue, which enabled me to look at it every day without disturbing it, and a lint compress was placed above. On the third day the dressing was removed, and lint dipped in warm water was applied for some minutes, after which it was gently dried. The surface presented a whitish appearance, but adhesion had already taken place, and the wound looked quite clean and dry, the temperature being slightly above that of the neighbouring part. The silk ligatures were removed on the fourth day. On the seventh day I separated the upper from the lower eyelid, and you will see that union has already taken place all round the edges of the wound, and that the outer segment of the flap has even become slightly assimilated in colour to the neighbouring skin of the face. In short, you see that the skin-flap of two inches by one not only sticks in its new bed like a piece of court-plaster, but has already been partly assimilated to it, and this only eight days after the operation.

But the case which I have next to show you is even more interesting, because it appears to me to have, in one respect, the force of a demonstration.

Case 2.—P. C., aged twenty-five, a quarrier, was admitted into the Glasgow Ophthalmic Institution with his face, eyes, and eyelids injured by an explosion of powder. The right upper eyelid, which was strongly everted, I partially succeeded in correcting by skin-grafting. The lower right eyelid being completely everted, its integument totally destroyed, and the skin of the face consisting of discoloured cicatrices, not by any means suitable for plastic operation, I formed a new lower eyelid with skin from the forearm.

The operation was done eight months ago, and the flap was of about the same size as in the previous case. I divided it into three portions: the first I applied without previous preparation, and the other two I prepared as stated above. I need hardly say that this difference of treatment was not intentional, for with the first portion I thought I had sufficiently cleared it in the removal, and so applied it without further examination; but with the second and third portions I examined the deep surface, and finding it insufficiently cleared of connective tissue, I pared it as described. The remarkable thing is that the two portions which were previously prepared healed by agglutination; whilst the first-mentioned portion, which was applied without previous preparation, looked rather livid the first day, the fourth day it began slightly to suppurate, and, after a hard struggle for life, a portion of it only remained, while the rest shrunk. This, however, did not materially compromise the result of the operation, and you will find the result highly satisfactory. The case is noteworthy, because it is in the same subject, and in the same piece of skin, and there is nothing else to account for the different processes in these three pieces; and further, because with my present light on the subject I should not be justified in repeating the experiment.

FIG. 2.

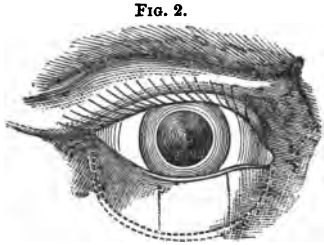


Fig. 2.—The vertical lines mark the division of the flap. The two outer and larger portions have been prepared before application; while the smaller, placed at the inner canthus, has been applied without previous preparation. The upper dotted line represents the elevated dissected edge, and the lower dotted line shows the point of insertion of the new skin.

Now, in examining this case, the eyelid is good, the skin is smooth, though it has still a whitish appearance, forming a slight contrast with the rest of the face, which is discoloured by powder, but not so striking a contrast as it was at first after the operation.

In examining this last upper eyelid, which I corrected by means of skin-grafting, you will see that its surface is not so regular; it is, in fact, still a cicatricial substance, and compares unfavourably with the smooth, regular appearance of the lower eyelid, which was produced by this new method.—*Medical Times and Gazette, June* 3, 1876, *p.* 608.

79.—THE TREATMENT OF BOILS AND CARBUNCLES.

By Dr. PETER EADE, Physician to the Norfolk and Norwich Hospital.

I think the usual treatment of boils and carbuncles, as set forth in works of medicine and surgery, may be briefly described as this. If seen within the first day or two of its appearance, we are told either to divide the pimple across, or to apply nitrate of silver to its apex; after this, we are told to poultice it, to apply cold compresses, or merely to use pressure; and, when the mass has grown large and tense, either to let it run its natural course, or to divide some portion, or the whole, of it by incisions, or by caustic, and again to poultice, and so on.

In 1866, the late Mr. Startin wrote in the the columns of the Journal of this Association that he regarded "boils and carbuncles as having frequently or constantly a parasitic origin"—this opinion being grounded upon the success of his special practice, upon the fact of his having once or twice found cryptogamic vegetation in them like that of sycosis, and upon the observed fact that boils are occasionally propagated to other parts of an affected person, or even to other individuals by very close contact. But he said: "My opinion of the parasitic nature of these complaints is chifly influenced by the rapidly curative effect of the application of parasiticides to the apex of the boil or carbuncle." These parasiticides were various forms of caustic, such as iodine, nitrate of silver, caustic potash, chloride of zinc, blistering liquids, and mineral acids, but the one which, for various reasons, he preferred to all others was the acid nitrate of mercury.

In my own practice, I have found these views of the parasitic nature of those diseases, as shown by the efficiency of destructive caustics, to be fully confirmed; but I believe that I have greatly improved upon Mr. Startin's practice, and that I have discovered that in carbolic acid we have an agent which is not only more safe, more manageable, and more universally applicable, but one which seems to be specifically destructive to the life and progress of both boils and carbuncles.

Boils are not uncommon, but carbuncles only occur in one's practice occasionally; but I may say that, in the several examples of carbuncle which have occurred to me recently, and in all the cases of boil, the carbolic acid has never failed—when properly and sufficiently applied—to arrest their growth and to abort them at once, if in an early stage; and to check their spread and prevent further extension in a later stage.

I believe it to be general experience that the pimple in which a boil begins its life and career may be destroyed by any common caustic, if thoroughly applied. I venture to assert also

that a carbuncle, even when very considerably advanced and of very considerable size, may in like manner be destroyed by the free application of carbolic acid to its centre and other parts.

The essentials for its proper action, so far as my experience has gone, appear to be these.

1. The acid must be applied in *strong* solution (four or five parts of acid to one of glycerine is the strength I employ.)

2. It must be brought into contact with the diseased tissue, for it appears to exert no influence on or through the unbroken skin. To this end, if sufficient opening do not exist when the case is first seen, a proper one must be fearlessly made in the very centre of the disease by some appropriate caustic, and, perhaps, the acid nitrate of mercury effects this better and with less discomfort than any other.

3. The acid solution must be occasionally reapplied to, and into, the hole thus formed, or those already existing, and I have found it a good plan to keep a piece of lint wet with a weaker solution constantly over the sore.

Take the following example which has occurred to me within the last two or three weeks.

A lady, aged 40, showed me a boil on the left buttock, of six days' duration. It was circular with a diameter of four inches; was red and angry looking; tender, hard at its base, and rapidly increasing. To the prominent point in its centre I freely applied acid nitrate of mercury over a space about one-third of an inch in diameter. Next morning, I removed the scab which had formed, and freely passed the strong carbolic solution into the little opening formed in the mass as well as I could with a quill pen charged with the liquid (and I may say that I find this a very convenient instrument for the purpose). At this time the swelling had increased considerably in size, was more tender and inflamed and painful, and was threatening to be a very formidable case of the disease. Now, mark the effect of the treatment. The acid was freely applied twice more, during the day, and the very next morning on my visit, it presented the appearance of having suddenly collapsed. It had shrunk greatly in size, was flabby, and far less painful, and its vitality was plainly destroyed. In four or five days, nothing remained but a little hardness about its base, and it rapidly got quite well. No core was ever discharged, and no pus appeared after the first application of the carbolic acid.

Now, to what does such a history as this point (and I could give several such histories did time permit? I think it says, as plainly as possible, that whatever the predisposing causes of boil or carbuncle may be, the disease itself is essentially a local one; that it is a disease parasitic in the skin or its sebaceous glands, and that it begins with a central portion or stem, from

and around which, as a root, the rest of the mass grows and extends. The spreading fungus-circles common in our meadows, and known as fairy rings, give us an excellent illustration of the type of growth; I think that the singular and constant effect of the destruction of the central portion in the way I describe, proves (as Mr. Startin thought) that which it is so difficult to demonstrate with the microscope.

I do not say that, when a huge carbuncle with its enormous growth into, and infiltration of surrounding cellular tissue has taken place, carbolic acid or anything else can be relied on absolutely and at once to stop its progress. It will probably then to some extent run through the stages of its life-history, but I believe that this is entirely because destruction of its centre is no longer the destruction of the life of the circumference, and because of the difficulty or impossibility of bringing the acid into contact with enough of the diseased mass. But even in a case or two of very large carbuncles, which I have seen for the first time in their later stages, and where the acid has been freely and assiduously passed into every hole which existed, I have been greatly satisfied with the apparent effect of the acid; and certain it is that, *wherever it touches* diseased tissue, all sloughing and suppuration at once there cease, no further extension of disease takes place, and a more striking change from dirty slough to florid granulation occurs in the course of a very few hours. So much have I been struck with this, that I propose, when the opportunity of a large developed carbuncle offers, to inject a watery solution of the acid into various parts of the diseased mass, in the hope of thus completely destroying it even at this stage.

To sum up, the doctrines implied and acted upon in this paper are:

1. That boils and carbuncles are not mere inflammations and sloughings of cellular tissue, but specific diseases.

2. That they are parasitic, and, as such, endowed with a definite life and history.

3. That, in their early stages, they may be infallibly destroyed and aborted by destruction of their central stem or root; and that, even after this stage has passed, they may generally be destroyed, and in all cases, at the very least, greatly modified, by the free application of carbolic acid.

4. That, to produce this result, the acid must be freely introduced into the central portion of the disease, and also into any other part where an opening exists or is formed artificially.

Until lately I had been in the habit of using a much weaker solution of the carbolic acid in oil or glycerine than I have spoken of above; but I now find that, when used in small quantities, the stronger solution is quite safe and very slightly

irritating, whilst its destructive power is, of course, much greater. Where, therefore, it is only intended to insert a small quantity into the mass, I advise that it should be of full strength; but where it is to be used more freely, or over a large surface, I only employ it much more dilute. The only constitutional effect I have ever witnessed from its free external application is the well-known blackening of the urine, and this has never appeared to produce the slightest evil result.—*British Medical Journal, July* 1, 1876, *p.* 5.

80.—LUPUS VULGARIS TREATED BY A MODIFICATION OF THE METHOD OF VOLCKMANN (OF HALLE.)

Cases under the care of Mr. BALMANNO SQUIRE at the British Hospital for Diseases of the Skin.

Volckmann's plan consists of scraping away the absolutely rotten and friable portion of diseased skin (nodular lupus deposit) by means of a steel spoon with sharp edges, the patient being under chloroform, and then, when the wound has healed, of setting up traumatic inflammation of the circumjacent skin, affected with molecular lupus infiltration, by numerous punctures inflicted with the point of a somewhat narrow-bladed lancet, repeating the latter operation, under chloroform, at intervals of a fortnight. Mr. Squire employs a much smaller sharp-edged spoon than Volckmann's—namely, one of about one-quarter of the size of Volckmann's, and also another spoon of about one-sixteenth the size of Volckmann's—for the purpose of enabling greater precision to be obtained in the draughtsmanship of the operation, and so greater conservation of the skin of the face (the commonest situation of lupus); and yet the small spoons are found by him to be sufficient for dealing in detail even with an extensive area of the disease. Then Mr. Squire, in place of the puncturation of Volckmann—which is rather an uncertain operation as regards uniformity in the effect produced—prefers to scarify the skin with regular linear parallel incisions, spaced uniformly about one-sixteenth of an inch apart. At each successive scarification he veers the direction of the parallel incisions, so that each succeeding set is oblique to the direction of the preceding set. The instrument used by Mr. Squire for this purpose is an ordinary cataract-needle, the head of which is, however, about four times the usual minute size. Then, for insuring uniformity in the draughtsmanship of the incisions, Mr. Squire prefers to effect anæsthesia of the affected skin by freezing it, rather than by the administration of chloroform, since, if frozen, the skin does not bleed when cut. In this manner the accurate

and regular draughtsmanship of the incisions is not defeated by a flow of blood from the very first cut.

Case 1.—A girl, aged twenty-two, from Guildford. Duration of disease on admission to hospital, two years and nine months. The disease affects the whole of the lower third of the nose, including the alæ and the under surface of that feature, and extends upwards into the nostrils for a short distance along the lining mucous membrane. The affected surface was covered with a thick greenish scab, which, on detachment, disclosed soft, pale, flabby, uneven granulations, discharging an ichorous pus. In this case, with a view to conservation of tissue, scarification alone has been employed, with, as yet, a most satisfactory result, the tissue having become firm, even, and non-discharging. Although it is still reddened, the sore has quite skinned over with a thin cicatrix, and no additional loss of tissue has eventuated.

Case 2.—A girl, aged seventeen, from Baldock. Duration of disease, since infancy—namely, so far as she knows since the age of two years. It has spread more rapidly during the last three years. Disease affects the left cheek only, the patch of disease measuring two inches and a half vertically, by one inch and a half horizontally. In this case scraping under chloroform was the first operation, followed subsequently by a repetition of scarifications under the ether spray. A fortnight ago all traces of disease (excepting the scar left by it) had disappeared, saving only two minute nodules of lupus. These, under the ether spray, were five days since gouged or cut out by means of the sharp spoon. The spots are now healing.

Case 3.—A girl, aged sixteen from Brentford. Duration of disease, two years. Area occupied by the disease, the same as in the case first cited—namely, the lower third of the nose,—only that the left ala of the nose is at its outer part partially exempt. The affected surface is covered with a thick greenish scab, which, on detachment, discloses the same condition of skin described in Case 1. This case, with a view to the conservation of substance as the chief object to be aimed at, has been simply treated by repeated scarification under the ether spray, with the result of preserving almost perfectly the natural shape and size of the feature affected, and of attaining a firm, smooth, solid substance, well skinned over, so that the nose looks merely reddened, as if chilled by exposure to a cold wind. The patient is still under treatment. In this case, as in the first, the patient was at separate periods scarified on the affected part of the interior of the nostrils, as well as on the exterior surface, but in every instance quite painlessly. On every occasion the incisions healed perfectly in between three and ten

days, and within between two and three weeks left no trace whatever of their having been inflicted.

Case 4. — A woman, aged twenty-eight, from Tunbridge Wells. Duration of disease, six years. Area occupied by it, the lower part of the nose and both cheeks. The nose is affected for its lower two-thirds, the alæ and lower part of the septum having been completely destroyed by the disease, so that the lower third of the nose has irrevocably disappeared. The left cheek is extensively affected by a large continuous patch of the disease. The right cheek is affected to a much less extent by smaller isolated patches. In all of the above-named situations the character of the scab and of the surface covered by it are the same as already described above in the cases of other patients. The patient, after various other plans had been tried at the hospital, without effecting a satisfactory result, was chloroformed, and the friable portions of diseased skin scraped off. The result of this procedure was to effect an apparently complete cure of almost the entire area of the disease, which cicatrised in a satisfactory manner. After a short time it became, however apparent, that at certain spots on the margins of the original patches the disease had not become completely annulled. These places were accordingly scarified under the ether spray, and the patient was kept for some time under observation. Recently, however, some small isolated nodules have become developed at some little distance from—that is to say, quite beyond—the original area of the disease. These, about five days ago, were accordingly scraped out under the ether spray. The places are now healing.

Case 5.—A man, aged thirty-three, from Leeds. Duration of the disease, six years. Area occupied by the disease, the lower two-thirds of the nose, and both cheeks in an equal degree. In this case, however, the greater part of the disease had already succumbed to treatment of a different kind. Only isolated fragments of the original patch remained. This was brought about by a long-continued and vigorous application of lunar caustic (in the stick); an assiduous rubbing of the diseased surface with the solid nitrate of silver. This kind of cauterisation was persevered in for nine months, ending March, 1875. During this period he was thus cauterised altogether about seventy times. He was not perfectly cured when it was discontinued. This plan of treatment the patient describes as unquestionably beneficial, but horribly painful—very much more painful than the endurance of Mr. Squire's operation on him. The treatment by lunar caustic has, however, conferred on the patient an irremediable disfigurement of a different kind. Over the whole of the area so treated—that is to say, over the whole of the greater part of the front of the face—his countenance has

acquired a deep slate colour, which gives the patient a somewhat startling appearance. The margins of the alæ of the nose, as well as the edge of the septum, have become destroyed. With the exception of a few small patches of disease on the cheeks—patches that seem to have developed themselves by the extension of minute spots that have escaped treatment by the caustic—the disease is now chiefly confined to the cutaneous margins of the remains of the nostrils and to the mucous membrane lining the nostrils. The portions of diseased surface which the patient presented were treated in the manner already described—first by scraping off, and subsequently by scarification,—the affected mucous membrane of the nostrils being as vigorously treated in this manner as the affected skin. The interior of the nostril and its margin were last scarified on May 22nd. The patient had before this almost completely recovered. The minute cuts last made are nearly healed.—*Med. Times and Gazette, Aug.* 26, 1876, *p.* 223.

81.—THE LOCAL TREATMENT OF PSORIASIS.

By WYNDHAM COTTLE, Esq., M.A., Oxon., Senior Assistant Surgeon to the Hospital for Diseases of the Skin, Blackfriars.

There are a class of cases of psoriasis, namely those not uncommon examples where there is an excessive formation of dry scales, in many instances even producing the thick crusts with which observers of this complaint are familiar, and forming in chronic and neglected cases as long as they remain an insuperable obstacle to recovery. This condition is very common in congenital and inveterate cases, and when in the neighbourhood of the joints these crusts form hard shells, they preclude movement, or at least restrict it, and render it painful. It is to such cases as these that I have found the treatment I am about to suggest applicable. The consideration that a material improvement in the condition of parts might be expected to follow the hindrance of evaporation locally, led me to endeavour to procure such a result. After various trials I have found the subjoined method most advantageous.

All crusts and scales having been removed as far as possible, and the absence of grease being ensured by wiping the parts with ether or rectified spirit, and the skin thoroughly dried, the solution of india-rubber is thickly applied with a brush over the affected places, and this application renewed as often as is needful for the formation and maintenance of a continuous covering of india-rubber over the affected skin. The chief difficulty I encountered lay in procuring complete adhesion of this covering, and in this respect I found india-rubber much superior

to gutta-percha or collodion flexile, &c. A very good solution has been supplied to the hospital by Messrs. Allen and Hanbury, of Plough-court, and which answers very fairly when carefully applied. Its composition is, india-rubber half an ounce, chloroform eleven ounces and a half. Solutions in ether were not found so suitable as those in chloroform, for, from their more speedy solidification by evaporation, some difficulty was experienced in their use, especially in the hands of patients.

I would claim for this mode of treatment that, in the majority of the class of cases mentioned, the recovery has been more rapid than with the ordinary local measures, and also very comfortable to the patient, free from the objectionable odour of the tar compounds; that its action is confined to the affected parts themselves, requiring no confinement of the patient, nor indeed causing any inconvenience to him; a further recommendation being its ease of application. At the same time I would guard against its being understood that I find this a local method of treatment to be indiscriminately used in this often somewhat intractable complaint, for the pathological conditions that call for the employment of some such remedy do not present themselves in the majority of cases; still I think it may be found a useful adjunct to the recognised treatment, and in a large percentage of appropriate instances give very good results. The mode of action of these coverings, that are impervious to moisture, seems to be that they prevent evaporation, and hinder the loss of the natural perspiration of the part. The result with which perhaps we are more concerned is that the affected skin, previously dry and harsh, and with its natural elasticity diminished, becomes supple, and almost moist, while the scales and crusts show little or no tendency to reform, any that may have been reproduced coming off with the india-rubber, leaving the skin almost normal beneath. After a time the deep red colour of the patches fades, there remaining eventually little more than the staining of the skin that always persists for some time.

This mode of treatment of course is not suited to cases in an acute stage, or in which excessive action is present. I have employed it in upwards of fifty cases, chiefly at the hospital, the details of which would occupy too great a space. I will, however, quote one typical instance.

A young woman, nineteen years of age, was admitted to the hospital on March 8th. She was of strumous appearance, but otherwise in fair health. Her affection had existed from childhood, with varying degrees of intensity, sometimes leaving her almost free, but with ever-recurring exacerbations. On admission her condition was as follows. Irregular patches, averaging about an inch and a half in diameter, were scattered over the

body, and more thickly on the outer aspect of the limbs, and especially about the elbows and knees, extending over the wrists and hands. These patches had a base of inflamed and thickened cutis, overlying and firmly adherent to which were hard and dry crusts, the results of hyperplastic action of the cuticular elements of the usual psoriasis type, in places exceeding the eighth of an inch in thickness, most abundantly developed around the elbows and knees. These crusts having been removed, to one side of the body and corresponding limbs the india-rubber solution was applied, while, to gain a comparative result, the other side was treated with mercurial and tar compounds. The affected places on the side to which the india-rubber solution was used at the end of three weeks became mere red markings, having lost in great measure their thickened bases, with but little tendency to the formation of scales remaining, while on the opposite side they continued to be produced, though with lessened activity, the inflammatory condition persisting. The india-rubber solution was then applied to the whole of the patches. She was discharged on May 3rd with only red stains to mark the former sites of the disease. The usual constitutional treatment was pursued.

In many of my other cases also one side or limb has in like manner been treated with these impermeable coverings, the corresponding parts receiving the more ordinary applications to allow of comparison of their actions.

The same local treatment is applicable also to some conditions of chronic eczema, but I have not as yet brought my experiments in that direction to a conclusion.—*Lancet, Sept.* 30, 1876, *p.* 460.

82.—CASE OF SYCOSIS TREATED BY CARBOLIC ACID AND CANADA BALSAM.

By Dr. G. A. STARK, Milwaukee, Wisconsin.

R. B. M., short, and of a nervo-sanguineous temperament, applied to me on the 22nd of May, 1874, suffering from an attack of sycosis or mentagra. He says that he contracted the disease at a barber's shop, about three weeks before. Had been under treatment elsewhere for about two weeks, and as no improvement had taken place, he was much discouraged. He had become thin, nervous, irritable and sleepless, and his strength and appetite had failed. The disease was confined to those parts covered by the beard, whiskers, and moustache, and was accompanied in some cases by inflammation, in others by induration, and in some by suppuration. Numerous scabs also were present. The pustules were characteristic, small and acuminated, and a hair traversed the centre of each. The scabs

and pustules were more numerous on the left side and under the chin than elsewhere. Hairs when extracted looked as if covered with a whitish powder.

Treatment.—He had been using benzoated oxide of zinc ointment. I prescribed an ointment of ac. carbolic gr. x to the zinc. ox. ʒi, to be applied thoroughly two or three times a day, the hairs to be first cut short, and the parts washed with juniper tar soap. He was put upon iodide of potassium with tonics, and ordered a purgative when necessary. Diet: beef-tea, milk, eggs, &c. This treatment was continued for about a week, and I also pulled out the hairs in some places; the disease, however, continued unabated.

I then ordered the iodide of sulphur ointment to be applied as above for a week, without any perceptible improvement, and the patient complained much of the irritation caused by the application. I now ordered him a teaspoonful of the elixir iodo-bromide of calcium compound in a little water, before each meal and at bed-time. I also prepared the following to be applied by a camel's hair pencil, viz., equal parts of carbolic acid and Canada balsam. The change proved satisfactory, improvement being most apparent where the hairs had been pulled out. Epilation was then done more generally and the preparation applied as before. The first application was made on June the 5th, and by the end of the month the disease was completely cured. I ordered him to continue the internal treatment for another month, as his appetite and general condition improved under it. I also recommended him to go on using the juniper tar soap.

The acid in combination with the balsam acted admirably in this case. The acid, especially after epilation, enters the pustules, and thus strikes at the very root of the disease. The contents of the pustules are almost instantly converted into a white crisp, and I have no doubt it destroys the offending parasite. The balsam forms a varnish over the parts to which it is applied, and thus diminishes irritation. The irritation caused by the application only lasts a short time, and is followed by relief. The irritation is not to be compared to that caused by the application of iodide of sulphur ointment, &c. The patient's appearance is much improved, the parts looking somewhat paler than natural, instead of being studded with pustules, or covered with filthy-looking scabs. If applied thoroughly, once in three or four days, or in some cases a week, would be soon enough to renew the applications. If necessary, it may be applied every day. It may also be used in different proportions as to the proportion of acid in the combination, as deemed most suitable in each particular case. I have found this preparation satisfactory in other forms of disease of the

skin, as ring-worm, &c. It is worthy of trial in any form of disease of the skin which is thought to be of parasitic origin. I have accomplished more with this combination, prepared in suitable proportions respectively of the acid and balsam to suit individual cases, and in much shorter time, as an external application in many forms of cutaneous affection, than with all other local applications combined. I have also found it to act well in some cases of burns and scalds.—*Canada Medical and Surgical Journal, Sept.* 1876, *p.* 97.

SYPHILITIC AFFECTIONS.

83.—ON THE ORIGIN OF INFANTILE SYPHILIS.

By Dr. ROBERT CORY, Assistant Obstetric Physician to St. Thomas's Hospital.

When infantile syphilis was first recognised, it was very naturally attributed to direct inoculation at the time of birth. Afterwards, however, when it was found that, except in a few instances, the mother was not suffering from local sores at the time of birth, another explanation was offered, which is still very generally held—namely, that the disease was inherited like other hereditary diseases, and that consequently it was communicated to the offspring at the time of conception. A corollary followed from this—namely, that the diseased fœtus might indirectly convey to the mother the disease of the father. Now, looking at the facts and arguments in support of these views, they seem only partially to support it.

Let us consider the cases adduced first. They may be divided into two classes:—1st. Those where, the father having had syphilis, the mother gives birth to a child which afterwards suffers from the disease, but she herself remains absolutely free. 2nd. Cases where the mother, during pregnancy, without any discovered primary inoculation, suffers from syphilitic symptoms. In some of these cases the woman is said to suffer during each pregnancy, but remains well in the interval.

The alleged cases of the first class are the most important, for, if true, they are conclusively in favour of the received theory. M. Diday mentions several of these in his work on "Infantile Syphilis," but one which he details is sufficient to throw suspicion on all, for it indicates how a fallacy may arise, and also shows how facts may be bent to theories. The case is this. "The wife of a syphilitic man gave birth to a child which became syphilitic. The woman, however, suffered from no symptom whatever, unless a small patch of granular redness

on the fore part of the neck could be said to be such. This woman becoming a widow, married a healthy man, but again by him gave birth to a syphilitic child." M. Diday supposes in this case that an impression was left behind on the woman by her first husband, which was capable of infecting her subsequent children, in some such way, I suppose, as the subsequent foals of a mare once covered by a zebra are sometimes impressed with the markings of the zebra. He does not, however, admit that she had herself contracted syphilis, because she presented no symptoms, and he argues against the small patch of redness being such. Here he thinks that it was possible for a woman to be free from syphilis herself, yet to give birth to a syphilitic child, the result of her former husband's impression, the real father being healthy. This assumption is directly contrary to the fact observed and stated by Mr. Hutchinson, "that he has never known a mother infected by suckling her syphilitic child;" evidently *because* she is protected by a previous attack of the disease. We see, therefore, of how little value the first class of cases become.

With regard to the second class of cases, I think an explanation can be found more conformable to facts than the present interpretation, and it is this: That in all these, where the mother shows symptoms of syphilis while carrying her child, and afterwards gives birth to an apparently healthy child, which is subsequently attacked, she infects her offspring at birth by her blood; for we can readily suppose that, at the time of the separation of the placenta, before the fœtal circulation has ceased, some of the mother's blood may be swept into the fœtal circulation along the umbilical vein. If this be so it will also explain why the liver is so early and seriously affected in infantile syphilis. The only difficulty left is the question—How is the mother affected if not by the fœtus? In answer to this I will offer a suggestion—namely, that previously to her pregnancy the mother has been infected by an ovum impregnated with a diseased spermatozoon, and the necesssry result of this has been a very early abortion, so early perhaps as only to cause a retarded menstruation; that ultimately two healthy elements have combined, with the result of producing a healthy fœtus. In some cases, moreover, a primary inoculation may have been overlooked. It really seems quite incredible that a child, the offspring of a diseased first element, should apparently be in perfect health at birth, and moreover should have transmitted, long before this time, a disease to its parent of which it shows the symptoms itself. Another fact which supports these views is the period elapsing between the birth and the manifestation of the disease, which, though perhaps a little shorter than the incubatory period of syphilis, is yet not far from coinciding.

Another difficulty with the present received views is the great difference between syphilis and the other hereditary diseases. If it be such it stands forward as a marvellous exception to the others, for not one of them has been proved to be contagious or inoculable, nor does one attack of any of them convey an immunity against another attack. In most, if not all, the individuals subject to hereditary disease health remains until they are subjected to the noxious influences which gave rise to the disease in the parents. In other words, they are born with a greater liability to be influenced by external irritants. Some portion of their construction is weak, but they are not born with the disease.

This is not what is contended for syphilis. Here a disease is fostered in the growing embryo; it is built up with it, but it is not destined to show itself until three or four weeks after birth. No care can avoid the attack. The disease is present, is strictly inherited. The difference therefore is easily seen, because if syphilis corresponded to the other hereditary diseases, a child would be born with a greater liability to take syphilis, but not with the disease. There are some individuals who are born with a liability to take small-pox. These may have it three or four times in their life. They inherit small-pox in the same way as another inherits phthisis; for I am one of those who believe phthisis is always the result of external irritants acting upon a weak lung; the weak lung is inherited, but not the phthisis.

We know that structural differences are inherited, and it is probable that all so-called hereditary diseases depend on structural peculiarities.

Lastly, if we glance at the explanation that has been offered to account for the manifestation of syphilis in the infant four weeks or so after birth, I think we must confess that it leaves the matter in as great obscurity as ever. I refer to the suggestion of Mr. Hutchinson—viz., that the child may manifest symptoms of syphilis when exposed to the light in some such way as chlorophyl is developed in the leaves of a plant, or as the tadpole is developed into the frog by the same influence.

I will sum up in a few words the proposition I have tried to maintain. First, that in most cases of infantile syphilis the fœtus remains healthy until the time of the separation of the placenta, that it is then infected by the blood of the mother, and therefore that in all such cases the mother must have been primarily infected. Secondly, that it is not improbable that the mother is first infected by an early abortion, so early perhaps as only to cause a retarded menstruation, or that in some cases she may have had an overlooked primary sore.—*Lancet*, *June* 17, 1876, *p.* 885.

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

84.—PREGNANCY WITH UNRUPTURED AND IMPERFORATE HYMEN.

By Dr. E. J. Burgess, Midwifery Assistant, St. Bartholomew's Hospital.

On the 25th of July I was sent for to see a patient who stated that she was unmarried, that she had ceased to menstruate since last December, and that from that time her abdomen had gradually increased in size. She was now evidently in labour; her uterus, from its size, apparently containing a full-term child. An abdominal examination gave all the signs of pregnancy at full term, and her labour-pains were strong, regular, and occurring every ten minutes. On attempting to make a vaginal examination I could not introduce my finger more than one inch beyond the orifice, where it came on a tough resisting membrane. The external parts up to this membrane were rather dry, and my finger was not stained with blood. I introduced a speculum, and then discovered a complete hymen stretched across the vagina, having a median raphe, with a small hole in the raphe at about the junction of the middle with the anterior third of its distance in the conjugate diameter. The opening was about the size of the urethra, and from it flowed a little normal blood and about a wineglassful of fluid looking more like aqueous humour than anything else. I feel persuaded I made the hole myself when introducing the speculum, as up to that time neither blood nor discharge of any kind could be detected in the parts below the membrane. I sent for the house-surgeon (Mr. Edwards), and with his assistance the patient was placed on her back, and, a catheter being first introduced into the bladder, a pair of scissors was inserted into the opening in the hymen, and the membrane afterwards torn by the introduction of two fingers. The fœtal head could then be felt dilating the cervix uteri to about the size of a florin. The patient was then sent home in a cab, and about three hours afterwards was delivered of a healthy male child. I should state, that though the hymen was quite perfect, the caruncuIæ myrtiformes were very plentiful all round this septum about one-eighth of an inch from its point of union with the vaginal walls.

The girl, after repeatedly disowning any knowledge of her condition, confessed to having had sexual intercourse about last November. Connexion, she said, was very painful and difficult. Her catamenia had been regular all her life up to this pregnancy, and she volunteered the statement that her sufferings at those times were quite as great for three days as her pains when I had seen her in labour.

Professor Gustave Braun, of Vienna, published (Wien. Med. Woch., March 25th and April 1st) three cases of pregnancy with unruptured hymen. These cases are to be found transcribed into the Medical Times and Gazette of May 20th, 1876. But these examples differ from mine, inasmuch as though the hymen was in these three unruptured, it was in none imperforate.

I would suggest that ever since last December, not having menstruated, the small opening which she must have had at the time of sexual intercourse had had time to close by healing, and it is not, perhaps, too much to presume that the pain at her menstrual periods, which, by-the-by, was worse on the day preceding the discharge, was due in great part to the fact of the imperforate character of the hymen, which had closed over since the previous catamenia four weeks ago.—*Lancet, Aug.* 12, 1876, *p.* 237.

85.—A CASE OF ACCIDENTAL HEMORRHAGE WITH SHOULDER PRESENTATION; FATAL THROMBOSIS OF THE RIGHT PULMONARY ARTERY.

By Dr. GEORGE ROPER, Physician to the Eastern Division of the Royal Maternity Charity.

On the 3rd June, 1876, I received a written request from one of the midwives of the Royal Maternity Charity to visit a patient who was described as having "faints and hemorrhage before delivery." I went immediately at 11 a.m. The patient was thirty-seven years old; in labour, with her sixth child, at full term. Her previous labours had been good. Pains had commenced slightly at 1 a.m., and at 9 a.m. the first symptoms of flooding were observed.

I found her in a state of great prostration amounting to collapse. She had a ghastly expression of countenance, indicative of great suffering. She complained of severe pain across the abdomen; this was constant, but greatly aggravated during uterine contraction.

The discharge consisted of blood-stained serum, there was no clot either externally, within the vagina, or in the os uteri. This was well dilated and soft. The membranes were not entire. The shoulder presented. I passed my hand into the uterus with great ease, and immediately came on a foot, and version

was effected with as little difficulty as possible. The child was stillborn. The uterus was large and doughy, and on squeezing it with the hand the placenta and several large black old clots were precipitately expelled.

The uterine surface of the placenta was studded with whitish, fibrinous-looking patches, very much resembling gummata. No history of syphilis was obtainable. There was no post-partum hemorrhage. She went on well till the third day, when severe rigors occurred, succeeded by high febrile disturbance. On the fifth day she had a pulse of 130, temperature 102°, severe headache and much sweating. There was a small amount of fœtid discharge, bowels confined. She was ordered castor oil. A mixture of chlorate of potash, hydrochloric acid with spirits of chloroform three times daily. To have all the light nourishment she can take, and five ounces of wine or brandy during the twenty-four hours. She continued in much the same state for the next three days. Throughout the night of the eighth day she complained greatly of headache, and was delirious. Pulse continued quick and temperature high. There was a degree of breathlessness, and she had a severe pain through the right side of the chest, chiefly beneath the right scapula. There was still a slight fœtid discharge.

On the thirteenth day she was in all respects greatly improved, and requested that she might be allowed to sit up; but I advised her to remain in bed a few days longer. As she was so much better. I told her I should visit her only once more when I was in the neighbourhood. On the fifteenth day after delivery she sat up and enjoyed her dinner, at which she drank some ale. After going to bed at 6 p.m. she expressed a wish to have a glass of ale, and this was given her. Soon afterwards she required to get out of bed for the purpose of relieving the bowels, and when in the act of sitting down she fell forwards on the bed, as her friends thought, in a fit. She gasped for breath, said she must be suffocated, and felt sure she was dying; became blue in the face and expired in about ten minutes. She was quite conscious all the time.

My friend, Dr. Edwin Burrell, kindly made an examination of the body nineteen hours after death:—Rigor mortis well marked. Face and surface of the body generally pallid. No abdominal distension. Head not examined. Heart pale and flabby. Right auricle and inferior cava empty. Superior cava contained a small light-coloured clot. Muscle of right ventricle thin and pale; its cavity empty, many small light-coloured granular clots adherent to its lining membrane. A large clot of partially decoloured blood was in the right pulmonary artery, extending down to the bifurcation of the main artery and somewhat obstructing the orifice of the left artery. The clot in the right

artery extended up to the smaller branches, near the apex of the lung. The main branch and the larger vessels were not so tightly plugged as the smaller ones. The coagulum could be drawn out from the smaller branches as tough cords. The lung was everywhere fairly crepitant. The left pulmonary artery was free from clot. The heart was free from valvular disease. No fluid in the pleura or pericardium. Liver and kidneys healthy. The uterus for the period after delivery, well involuted; its substance and mucous membrane looked healthy, as also the right ovary, but there was an adhesion between the left ovary, the sigmoid flexure of the rectum, and a portion of omentum. The left Fallopian tube was enlarged.

The uterus and its appendages were removed and submitted to Dr. John Williams for examination. He has kindly given me the subjoined report:—

"I have examined the uterus, and find that in the left broad ligament, close to the uterus, are several small abscesses. The right ligament appeared healthy, as well as both ovaries."

Microscopic examination of the muscular structure of the heart discovered well-marked fatty degeneration.

The fibrillæ were much disintegrated, and oil globules were everywhere present.

This case is of much interest in a double point of view.

1. As one of thrombosis of the pulmonary artery.
2. As one of accidental hemorrhage.

1. As a case of thrombosis it resembles all others of its class. There were present those conditions of blood (hyperinosis and inopexia, and probably toxœmia) which are considered the chief factors in the production of thrombosis. The fatty heart too must not be left out as a cause. These agencies were amply sufficient to have given rise to primary thrombosis.

On the other hand, there was a local affection in the region of the left ovary, from which a small venous clot might have been derived, eventually to become an infarct in one of the smaller branches of the pulmonary artery, thus producing thrombosis of a secondary or embolic kind. To these questions I can give no answer. I regret that the clinical history of the case is so imperfect, especially as regards the thoracic physical signs. For several days, in the midst of the severity of her illness, she complained of pain of an aching kind through the right side of the chest, beneath the right scapula. There was an absence of cough, but all along there had been a degree of breathlessness. This did not attract much attention, being such a common consequence of partially empty bloodvessels. Whether there would have been defective respiratory murmur, or any appreciable dulness on percussion, I cannot tell. The free crepitation of the lung after death indicated that there was

little or no defective respiration, so far as the admission of air into the lung was concerned. It presented a demonstration of the production of asphyxia in a peculiar mode—as Dr. Playfair has put it: "not because air cannot get to the blood, but because the blood cannot get to the air." I regret less the absence of observation on any morbid sound which might have been heard at the base of the heart, because there sounds are often of doubtful origin, arising sometimes from a half-filled vessel, or from a morbid state of blood, as well as from the more mechanical causes. With such a combination of symptoms a localized pain in the chest possesses much significance. The clot in the main tube of the right pulmonary artery was less tightly impacted than in the smaller branches; indeed, it did not nearly occupy the entire calibre of the main branch, but was quite loose in it. Its lower end hung down as a flap or valve, so as to obstruct partially the left pulmonary artery, and it is probable that the downward increase of the clot in the direction of the heart at last interfered with the current of blood into this vessel. From the absence of all inflammatory change in the texture of the right lung, coupled with the patient's convalescent condition, it is reasonable to conclude that the lung would eventually have recovered from its thrombic state had it not been for the accident of the lower end of the thrombus shutting off the current of blood from the left artery, and thus causing speedy death.

2. This case, as one of ordinary accidental hemorrhage, was very typical. One symptom existed which has not till lately been particularized. I had observed this so long ago as 1864, in a case very memorable to me, from the great anxiety it caused me throughout a long night. The patient was for hours threatened with death from all the aggravated symptoms of this form of flooding. There was no external bleeding so far as *clot* was concerned, but there was an abundant discharge of *blood-stained serum*. This came away in great quantity. It is the stained liquor sanguinis squeezed from the retained coagula. Such a discharge may not be regarded as constituting a flooding, but it is so, and its presence at once differentiates this kind of flooding from that of placenta prævia. In the latter case there is always a proportion of clot discharged externally. I am anxious to make these observations on this particular kind of discharge, because Dr. Barnes, in the last edition of his work on Obstetric Operations, has credited me with it as an original observation, confirmed by his own experience. Although I had observed it in 1864, I had not published it. In the Lancet of 1869 will be found the first record of it, with which I am acquainted, by Mr. Edward Calthrop: "On the Diagnosis of Accidental Hemorrhage from Placenta

Prævia." His own observations are so identical with my own that I cannot do better than repeat his expression of them :—

"In a case of placenta prævia—say at the sixth month—the discharge, if any, is blood, 'pure et simple,' and, on examination, the vagina is most likely full of, or at least contains, clots. In a case of accidental hemorrhage the discharge is liquor sanguinis, and the vagina free from clots; and it is easy to understand how this is. The blood in placenta prævia comes directly from the uterine or placental vessels, leaving coagulations behind in the vagina; whereas in accidental hemorrhage the blood, before being discharged, has to find its way to the os, separating the membranes as it comes down, and depositing its fibrin, so that the discharge is liquor sanguinis, and the vagina is free from clots."

I have only spoken of this characteristic discharge as a single symptom, which indicates the differential diagnosis between the two forms of hemorrhage—not, however, to the exclusion of the numerous other symptoms which afford distinguishing proof. Nor will this discharge be present in that very rare kind of accidental hemorrhage which has been called "concealed."—*Obstetrical Journal, Sept.* 1876, *p.* 374.

86.—ON UNUSUAL UTERINE HEMORRHAGES.

By Dr. FORDYCE BARKER, of New York, U.S.A.

There is a class of cases in which uterine hemorrhage occurs independently of any peculiar condition of the uterus itself. Certain conditions of the ovaries may give rise to an unusual discharge of blood from the uterine cavity.

Acute ovaritis is one of these conditions; and although very rare in the non-puerperal woman, yet under the influence of strong sexual excitement, or by some sudden shock, emotional or physical, the process of ovulation is arrested, acute ovaritis is excited, an increased fluxion of blood towards the uterus is developed, and profuse hemorrhage may follow.

Ovarian dysmenorrhœa is another condition which is sometimes attended by profuse uterine hemorrhage, although deficient menstrual discharge is more frequent. There is what has been termed the ovarian temperament, a condition in which the ovarian function is very active, fully completed, while the uterine function and development are correspondingly imperfect. This class of cases is characterised by the early appearance of menstruation, by an excitable nervous temperament, a tendency to hysteria; and when menstruation is to appear, the function will be preceded for two or three days, or even more, by languor, nausea, headache, pains in the breast, and frequently by severe pains in the region of the ovaries; and when at last

the menstrual discharge appears, in a certain although not large percentage of cases it is apt to be excessive. These cases of ovarian dysmenorrhœa and menorrhagia are not very rare. In some instances great benefit is derived from the use of bromide of potassium, administered in free doses for a few days previously to the occurrence of menstruation; and to this may be added leeching at the commencement of the ovarian symptoms. Of course, the woman should maintain the most perfect quiet and rest in the recumbent posture during the entire time occupied by each menstrual epoch.

Sometimes the shock developed in this class of cases will be such as to require an entirely opposite course of treatment. Here again the plan to be pursued is determined by the general condition of the system; and if there is a depressed condition present, it must be met by the use of those agents well recognised as being proper and important in the treatment of shock and depression under any circumstances.

Both plethoric and anæmic conditions of the system are found associated with ovarian dysmenorrhœa and menorrhagia.

Acute ovarian displacements, such as a sudden prolapsus of an ovary from violent effort, or shock, or produced by constipation, may give rise to menorrhagia, as a result of the highly congested ovary. When this accident occurs it will be attended by acute symptoms of displacement of the ovary; and the patient suffers greatly from the characteristic pains which attend this displacement, and the condition may be accompanied by menorrhagia extending over two or three menstrual periods. As a matter of course, the rational method of treatment under these circumstances is to overcome the displacement and the ovarian congestion.

There is another class of cases in which both menorrhagia and metrorrhagia occur, which are due to conditions of organs remote from the uterus, or constitutional causes, if you choose to call them such.

Profuse hemorrhage from the uterus may result from obstructed portal circulation, obstructed circulation through the right cavities of the heart, and also from certain diseases of the kidneys.

Disturbed brain-action from emotional causes may be followed by violent uterine hemorrhage. Such cases must have fallen under the clinical observation of most who have been long in practice, which are entirely unassociated with any evidence of local affections of the uterus.

Again, we have constitutional causes of uterine hemorrhage, which may be regarded as toxic.

Malaria is not unfrequently the cause of menorrhagia, not always profuse, but the menstrual flow is prolonged unduly by

he general impairment of the constitution and the defective utrition of the blood-vessels of the uterus from the continued nfluence of malaria.

Menorrhagia may be caused by the toxic influence of various xanthemata. A most remarkable case of menorrhagia once ame under my observation, and occurred in the person of a girl, aged eleven years, who was suffering from measles. The exhaustion present in that case was equal to anything I ever saw in the adult female, having profuse uterine hemorrhage from any other cause. It was finally arrested, after a great variety of measures adopted had failed, by the introduction of an alum cone into the cervix. This is the only case I have ever seen in connection with measles.

I have seen four cases of this character occurring in patients sick with scarlet fever. It is also said to occur with typhoid fever, small-pox, yellow fever, &c.; but associated with these latter, menorrhagia has never fallen under my observation.

There is another class of cases in which excessive uterine hemorrhage occurs, dependent upon a constitutional cause somewhat peculiar. Perhaps I am wrong in classing these cases under a constitutional head; but the class of cases to which I refer may be described as follows. A woman who has been free from any uterine disease, perhaps has borne one or two children, suddenly begins to grow stout, and exhibits a remarkable tendency to obesity; so that from being a thin, spare woman, she increases in weight from fifteen to fifty pounds, or even more, and with this remarkable tendency to obesity there is in some cases a rapid diminution in the amount of blood lost at each menstrual period.

But there are other cases belonging to the same class, where, instead of diminution in the menstrual discharge, this tendency to obesity is accompanied by an excessive uterine hemorrhage. These are troublesome cases, for the reason that you will suspect, from the severity of the flow, some serious uterine lesion; but when you come to make the most careful examination, you will be rewarded by a failure to detect any condition which will satisfactorily explain the occurrence of the hemorrhage. The only thing which does explain the hemorrhage in these cases, is the increased size and consequent plethora of the uterus.

I think that cases of this class are not very rare. I have repeatedly examined the internal surface of the uterus, after dilating the cervix with compressed sponge, in these cases, feeling certain that I should find some uterine disease which would account for the profuse flow, but have been disappointed in the same number of cases by finding it entirely free from any lesion or disease appreciable or discoverable by the most careful examination. The appearance of these

patients is usually healthy, and the countenance is commonly flushed, but at the same time they are anæmic. The blood is impoverished, and the patient has a flushed face simply because the capillaries upon the surface, which are not large enough to allow blood of a normal character to pass through them, now carry red anæmic blood, and the slightest emotion or exercise causes them to be surcharged and the face to become flushed. They are cases of anæmia, and when placed upon the use of tonics, quinine, iron, chlorate of potassa, &c., instead of becoming stouter and increasing in weight, they will diminish in size and weight, while the patient is greatly improved in health and strength. It has seemed to me also that there are certain moral phenomena peculiar to this class of cases, for these patients almost invariably believe that they are suffering from some disease of the heart. They are especially liable to attacks of palpitation, and a very frequent complaint will be, that that they have awoke in the night and found that the heart has stopped beating.

The plan of treatment which I adopt for these cases is first to administer the acetate of ammonia and saline cathartics, for the purpose of depleting the blood of its excess of watery elements. Next, I use chlorate of potash as an agent of very great value, on account of the influence it has in changing the condition of the blood; and then come the preparations of iron.

In immediate association with this class of cases comes another form of menorrhagia, namely chlorotic menorrhagia. We may have chlorotic menorrhagia as well as chlorotic amenorrhœa, although it is not of such frequent occurrence. These cases, however, are sufficiently frequent to be met with by any man with an ordinary amount of practice.

Another class of cases, with which every practitioner must constantly come into contact, is menorrhagia associated with the climacteric period. These form a class of troublesome cases For some reason the menstrual function becomes more active than natural, and is sometimes prolonged as to duration, and abnormal as to frequency of recurrence. Many of these cases occur in women who, at the period of the menopause, have a tendency to become much more corpulent than in former life, and in some such the menorrhagia may be conservative in relieving dangerous plethora, but it is by no means confined to this class. It is also seen in the thin and spare. When it occurs, it usually excites great apprehension in the mind of the patient, for, with a great majority of women, the belief is strong that the time of the menopause is the time of all others most favourable for the development of malignant disease of the uterus, which will destroy their lives.

And it is only natural that we should expect to find some uterine lesion present, when we take into consideration the changes which this organ has undergone during a series of years. The mucous membrane has been constantly undergoing change, sometimes in the full development of the decidua of pregnancy, and certainly in the formation of the menstrual decidua. It is not surprising, then, that at this period a recurring physiological congestion should in some cases become a chronic engorgement, and arrest the incessant metamorphosis of the internal surface of the organ, which has been going on for thirty years or more, and thus result in some lesion of this surface.

In closing, I will briefly refer to the plan of treatment which I adopt in this class of cases. Where the uterus is found to be increased in size and weight, I direct the patient to use, for a week previous to the return of the expected period, suppositories made after the following formula:

℞. Extract of ergot (Squibb's), ℈ij; Cacao butter, ʒj.
Divide into 12 suppositories.

One of these suppositories is to be introduced into the rectum, morning, noon, and night: and I always give positive directions that they shall be carried far up into the bowel, and the patient must keep the recumbent posture for at least one hour. These are to be continued for a week previous to menstruation, and also throughout its duration. I prefer to use ergot in this manner, rather than by the hypodermic syringe, for the reason that the remedy is easily handled by the patient or nurse, and you avoid the risk of troublesome abscesses in the tegumentary walls of the abdomen, which in my hands have frequently followed the use of the ergot by the hypodermic syringe.

If the hemorrhage be prolonged, although not excessive, I infer that there is some lesion affecting the lining membrane of the uterus. I then have resorted to another plan of treatment, which, since I commenced it, I have rarely found necessary to repeat in any case beyond the second menstrual return. I introduce into the cavity of the uterus, cylinders of iodoform, made according to the following formula:

℞. Iodoform, ʒ ijss; gum tragacanth, gr. xv; mucilage, q. s.

Divide into ten cylinders, each one and one-half inches in length. One of these cylinders is to carried completely into the cavity of the uterus, and a pledget of cotton introduced against the cervix to retain it in position. Introduce one of these cylinders daily for five or six days previous to menstruation. The only objection to them, is the excessively disagreeable odour which attends their use. I have frequently heard patients complain of a most disgusting taste in the mouth, in less than

two minutes after one of these cylinders had been introduced into the cavity of the uterus. But to me, the results which have followed their use have been most satisfactory. These cases of climacteric hemorrhage are quite common, and are often found very troublesome to the practitioner. By the use of the suppositories of Squibb's aqueous extract of ergot, the chronic engorgement of the uterus may generally be effectually overcome. If the menorrhagia still persist, we have good reason for suspecting lesion of the internal surface of the uterus, which, I think, is cicatrised by the cylinders of iodoform. I have formerly used for this purpose sulphate of zinc, introduced into the cavity of the uterus, and in some cases of profuse hemorrhage the solution of the persulphate of iron; but in all those cases in which the cylinders of iodoform have been used for some days previous to the appearance of the flow, there has been subsequently no hemorrhage of sufficient importance to make the solution of the persulphate necessary.

I have sometimes found it necessary to use the suppositories at each recurring period for several months, as the tendency to engorgement of the uterus is very difficult to overcome at the period of the menopause.—*London Medical Record, July* 15, 1876, *p.* 294.

37.—CASE OF COMPLICATED LABOUR: COLLAPSE FROM POST-PARTUM HEMORRHAGE TREATED SUCCESSFULLY BY THE SUBCUTANEOUS INJECTION OF ETHER.

By Dr. A. V. MACAN, Assistant-Physician to the Rotunda Hospital, and Obstetric Surgeon to the City of Dublin Hospital.

The patient, who was pregnant for the 11th time, had had good health till within nine weeks of her confinement. She then began to complain of a gnawing pain in the lumbar and hypogastric regions. The abdomen was much larger than in any of her former pregnancies, which was caused by hydrops amnii. The amount of urine passed was much below the normal quantity. The labour was very tedious, from uterine inertia. The membranes were therefore ruptured, when an immense quantity of liq. amnii escaped. The fœtus belonged to the class of anencephalous monsters, the diagnosis resting chiefly on the unusual shape of the mastoid processes, and the violent movement of the fœtus when the finger came in contact with the exposed portion of the medulla oblongata. It was born without artificial assistance, but its birth was followed by post-partum hemorrhage and retention of the placenta. This necessitated the manual removal of the placenta, which was accompanied with but slight additional loss of blood. The woman, however,

t gradually worse, exhibiting all the symptoms consequent on ere loss of blood. I therefore determined to try the effect of subcutaneous injection of ether, as recommended by Professor Hecker, of Munich, (*vide* Irish Hospital Gazette for June, 75). As some blood was still escaping *per vaginam*, I thought necessary to combine it with the injection of the perchloride iron into the uterus. Soon after 45 min. of ether had been jected well into the cellular tissue of the abdominal walls action suddenly set in. The change was so sudden and unsual that no doubt could be entertained that it was due to the ther. The woman's convalescence was rapid and uninterrupted, he being able to leave her bed on the twelfth day.

The chief point to be attended to in making the injection is o pass the syringe well down into the subcutaneous cellular issue, otherwise troublesome abscesses may form at the seat of he injection. The quantity to be injected depends entirely on the pulse. Professor v. Hecker frequently injects from 3 ij. to 3 iv. at short intervals. The effect is very transient, so that the injection may have to be repeated. Its use need not be confined to collapse from post-partum hemorrhage. I have also tried it in accidental hemorrhage, rupture of the uterus, and puerperal fever, in all cases with more or less effect. Dr. Atthill, the present Master of the hospital, has used it with good effect in a case of placenta prævia, and it has been used by Dr. Bennett and Dr. Croly for collapse in cases of strangulated hernia. Professor Winckel, of Dresden, has used it in a case of pulmonary embolism following delivery, where it completely relieved the intense paroxysms of dyspnœa.

I think that further experience alone will enable us to settle the exact value of this mode of treatment, which is at all events worthy of serious consideration.—*Medical Press and Circular*, *May* 3, 1876, *p*. 358.

88.—TREATMENT OF HEMORRHAGE AFTER ABORTION.

In a discussion on this subject at a meeting of the New York Academy of Medicine (Feb. 3, 1876), Prof. Pallen stated that he at once proceeds to dilate the cervix either with the fingers or by some other means till it is sufficiently large to permit of the removal of the fœtus and placenta. He never leaves a patient with a placenta in the uterus, because of the liabilities to hemorrhage and the development of septic diseases. If the removal be delayed for twelve hours, it will give the woman very much more pain, and the bruising of the parts which may be necessary to effect its removal is apt to beget metritis. Prof. Pallen spoke at some length upon unusual hemorrhage occurring in non-parturient woman, under which circumstances it is to be regarded simply as a symptom. It may be due to ulcera-

tions from cancers, lupus, syphilis, fibroid tumours, &c., or to remote causes, such as emphysema, pneumonia, hepatic and renal difficulties. For insomnia depending upon uterine irritation Dr. Pallen has obtained most excellent results by the administration of the following:—℞. Iodoform gr. i.; extract. cannabis indicæ gr. ½; camphor. monobromid. gr. ii. Misce. At a subsequent period of the discussion Dr. Hubbard stated that for the last twenty years he had made it a rule to leave the placenta entirely alone in abortion occurring at from one to four months. If hemorrhage is severe after expulsion of the fœtus he tampons in the following manner, and leaves the case to itself. Take about one ounce of pulverised alum, tie it up in a fine cambric handkerchief, and leave the string attached. Introduce this little bag into the vagina and press it up against the os uteri. Behind this he usually places a piece of sponge, which also has a string attached to it, and the woman is then left. The next day this tampon is removed, and if hemorrhage occurs another is introduced and another day is allowed to pass. In a large number of cases the placenta will be found in the vagina quite certainly at the end of the second day.—*Practitioner, July* 1876, *p.* 57.

89.—ON DEFECTIVE UTERINE INVOLUTION AND ITS PATHOLOGICAL BEARINGS.

By Dr. Edward John Tilt.

[Defective involution of the womb is both an important cause and an important effect of disease.]

The perfect understanding of defective involution presupposes the knowledge of the natural history of uterine involution; and if this be still very incomplete, it must be remembered that it was only within the last thirty years that obstetricians have thought it worth while to pay any attention to the subject. They are not even agreed on the time required for the completion of the process, for while Smellie estimated it at three weeks, Scanzoni says it requires sixteen. Most gynæcologists think two months to be the time required, in which case the muscular structure of the womb would be renewed about the time when the lining membrane of the womb has been reproduced. With regard to uterine involution after abortion nothing is known except that its progress is slower after premature delivery. For a description of the anatomical phenomena of normal uterine involution, I refer to Dr. Arthur Farre's admirable article on the Uterus in "Todd's Cyclopædia," and for a study of its rate of progress, to a paper by Dr. Serdukoff. For my present purpose it will suffice to remind the reader that, although the contraction of muscular fibre may

help the process, uterine involution depends on the conversion into fatty products of no longer wanted muscular tissue and on the disposal of these products by the blood, while gradually a new womb is reconstructed upon the original pattern. Uterine involution should partake of the slowness, the steadiness, and the painlessness of chemico-vital processes, and instead of being promoted, it is interfered with by after-pains, the spasms and cramps of the puerperal womb. This normal rate of involution may be exchanged for one so rapid that Schroeder has seen it set up fever, and powerful enough to remove most of the muscular tissue, so that the walls of the womb were found no thicker than those of the intestine. This *super-involution* of the womb is so rare that I have not met with it, whereas *defective uterine involution*, or *sub-involution*, is of frequent occurrence, and the object of this communication is to show how it originates and fosters uterine diseases.

The time allotted to uterine involution should be understood as dividing itself into two periods. At first there is a rapid decrease in the size of the womb, although during the first few days after labour there be no parallel decrease of weight. This period may be roughly estimated at a fortnight, during which defective involution is caused by the serious diseases that obstetricians have then to contend with; and they also know this defective involution as a cause of post-partum flooding, and of that absorption of putrid matter which leads to puerperal lymphangitis and phlebitis. To this period I refer the cases that have chiefly struck Dr. Arthur Farre, who describes "involution as arrested without inflammatory action, so that the uterus remains undiminished in bulk, its fibre uncontracted, and its tissues unrenovated for several weeks or months after labour, the soft flabby organ being easily felt above the pubes, reaching sometimes as high as the umbilicus; while its cavity, tested by the uterine sound, may measure several inches in depth." I have only met the womb as thus described during the first fortnight of puerperality. After that, and more particularly after menstruation has occurred, it is gathered up into a more or less consistent and enlarged ovoid. Some of the causes that interrupt involution in this first period do so in the second period, which may be said to extend over six weeks. I have already mentioned premature labour as a cause of defective involution; the undue prolongation of labour is a much more potent cause. My assertions as to this have been confirmed by Dr. Goodall and by Dr. Serdukoff. Involution proceeds at a slower rate in oldish women and in those confined during the last decade of reproductive life. Every variety of puerperal fever checks uterine involution, even if the womb be not faulty. Any kind of uterine inflammation checks uterine or periuterine

involution, and the check is proportionate to the extent of the disease. Lastly, defective involution may occur without apparent cause, and is then to be attributed to something wrong in the innervation of the womb, or to an all-pervading general state of debility.

Debility should be the first thought of the practitioner, as a frequent cause of defective involution, for the early exhibition of some preparation of iron often visibly improves the appearance of the patient, and by dispelling uterine congestion it promotes involution. When, however, strength does not follow the use of tonics, and when, a few weeks after delivery, the patient complains of bearing-down sensations, pelvic distress, and muco-purulent or bloody discharges, their cause should be ascertained by a carefully made examination. If, on the contrary, the beginnings of uterine disease are overlooked, they take root in an imperfectly involuted womb, and the patient is likely to become a confirmed invalid with a subsequent history of deranged menstruation, miscarriages, premature deliveries, and bad recoveries. I often trace long years of perfectly preventable misery to the injudicious management of a bad getting up, so I consider defective involution to be most frequently caused by some form of post-partum uterine inflammation. The frequency of this, under a mild form, is admitted by many pathologists, and lately by Dr. Fordyce Barker in his work on Puerperal Fever. Still more recently Dr. Serdukoff has satisfied himself by clinical observation that involution is checked by metritis in proportion to its intensity. Sometimes it is endometritis, particularly when it has been necessary to peel away the placenta. In such a case an amount of laceration that would have soon healed up if the womb could have properly contracted may become a serious matter, if in an unhealthy woman the womb remained involuted. Most frequently, however, involution is checked by the bruising and laceration of the cervix uteri. This often repeated statement of Dr. H. Bennet's and of mine has been amply confirmed recently by the late Dr. Phillips, who, in recording his experience at Guy's Hospital, estimated the frequency of cervical laceration at 10 per cent. of ordinary labours, and as the rule in tedious labour; and Dr. Atthill, of Dublin, also admits that cervical laceration, as the result of labour, is frequently overlooked. No doubt most of these lacerations heal by first intention in healthy women, but when they are unhealthy or the rent extensive, as after the unskilful use of instruments, the sore festers and becomes a centre of congestion and inflammation, which arrest involution.

When these lesions are recognised and properly treated in the first months of puerperality, suspended involution is resumed, and the womb shrinks to its right size; not sō when these

lesions have been overlooked and allowed to proceed unchecked for a year or longer, for surgical treatment of the cervix will only be partially successful, and the body of the womb may remain too large.

From what precedes it appears that defective involution, to become apparent, requires to be associated with some other pathological condition; that by itself it is seldom a disease, but much more frequently the enlargement of the area in which a disease may originate, be it congestion, inflammation, ulceration, a polypoid, or other growth. Moreover, defective involution not only magnifies the area of uterine disease—it makes it last longer and promotes relapses. The larger the womb, the greater its blood-supply, the more eccentric will be its blood-fluctuations, and the more difficult it will be to cure disease grafted on such a womb. Uterine involution being checked, there is a more or less extensive bag, with walls in a transitional state. The growth of the new muscular fibre may not proceed *pari passu* with the decay of the old; while the cervix has nearly recovered its right size and consistency, fatty degeneration may proceed too fast in the median region of the womb. This softness and pliability of the uterine walls clearly explain the frequent rise of post-partum uterine flexions; whereas in the nulliparous womb the cavity is linear, the walls singularly firm and thick—it is extremely rare to find them softened,—so there is no pliability of walls to account for flexions of the virgin womb. Dr. G. Hewitt has lately stated that in young women of a delicate constitution there is not unfrequently a considerable softening of the virgin womb, the result of the general want of tone; but until a statement so contrary to my own experience is confirmed by other observers and by the teaching of the dead-house, I shall be disposed to fear that Dr. G. Hewitt's finger has been unconsciously biased by the desire to find so satisfactory an explanation of uterine malformations of the virgin womb.

Diagnosis.—I have already said that a soft flabby mass extending from the pubes to the umbilicus is a form of defective involution to be only observed in the earlier part of puerperality; that, generally speaking, after the third week the enlarged womb is to be felt well gathered up above the pubes. A vaginal examination gives the impression of the womb being larger than it ought to be, and its size may be more accurately estimated by a rectal examination. A still more correct measurement may be taken by means of a wax bougie, for, as in a womb of the right size, it should be brought up at a depth of two inches and a half. If, after parturition, the bougie measures from three and a half to five inches, the excess of length must be attributed to an enlargement of the body of the womb, unless it can be explained by unnatural elongation of

the cervix. From what I see and learn, I believe the uterine sound is often used to the detriment of the patient, and I will remind junior practitioners that during the two months of normal uterine involution, and for longer when it is defective, the walls of the womb are of a yellower colour, of a more friable texture, and are therefore more liable to be perforated. A wax bougie No. 4 takes the measure well, and can do no harm.—*Lancet, July* 1, 1876, *p.* 5.

90.—ON THE HYPODERMIC INJECTION OF ERGOTIN IN CASES OF UTERINE FIBROIDS.

By Dr. LOMBE ATTHILL, Rotunda Hospital, Dublin.

I, in common with all those who practised the hypodermic injection of ergotin, as recommended by Hildebrandt, have found that this treatment, sooner or later, resulted in the formation of troublesome sores. I think it of some importance to say that, though this is perfectly correct with reference to the cases published by me, and quoted by Dr. Byford in his essay, it is not so with respect to my more recent ones. I have availed myself, since my appointment to the Mastership of this Hospital, of the large opportunity offered me here to carry out this treatment more extensively; and I give the following cases as examples of the results obtained. Case 1, of large intramural fibroid, in a widow, nulliparous, aged 38; prominent symptoms, distress from weight and size of tumour, menstruation increased but not excessive, returning at intervals of twenty-one days; with an intramenstrual discharge of blood, moderate in quantity, lasting for three days, thirty injections, practised at intervals of two and three days. Result: total disappearance of the intramenstrual discharge, slight prolongation of the intramenstrual period, hardening and apparently slight diminution of the bulk of tumour, no pain caused by injection or irritation following it. Case 2.—Single woman, aged 45, rendered exsanguine by profuse menorrhagia, accompanied by excessive pain, and lasting fifteen days and upwards, intramenstrual period of not more than from seven to ten days; of late, in fact, seldom free from a red discharge; large intramural fibroid, filling up pelvis, and reaching to within an inch of umbilicus. Upwards of sixty injections of ergotin; admitted January 6th. Result: March 10th, flow diminished in quantity and lasting for six days, intramenstrual period prolonged to twenty-one days; April 1st, menstruation reappeared this day, lasted but two days; May 21st, menstruated to-day, flow lasted four days. Marked as the improvement was as regards the check put on the loss of blood, her condition

in other respects was not satisfactory; her sufferings, always great, were aggravated, the injection being always followed by severe pain, referred to the tumour, necessitating the constant use of morphia; she seldom could leave her bed; and I finally abandoned the treatment, and am now endeavouring to enucleate the tumour. I hope, at a future time, to publish the case *in extenso*. At present, I wish merely to point out the fact that the injection of ergotin, in neither of the two cases I have detailed, was followed by the formation of sores; nor has it been in several others in which it has been recently practised for a shorter time by me. The only explanation I can give of the greater success, in my later cases, is this, that whereas I formerly added a small quantity of glycerine to the solution of ergotin, as recommended by Hildebrandt, I now employ a solution of one part of the extractum ergotæ liquidum (British Pharmacopœia) in two of water. injecting 15 or 20 minims of this each time. I always insert the needle into the gluteus muscle, making it penetrate to the depth of more than an inch.—*British Medical Journal, Sept.* 2, 1876, *p.* 299.

91.—ON DILATATION OF THE UTERUS IN DISEASE OF THE CAVITY OF THE ORGAN.

By Dr. LOMBE ATTHILL, Master of the Rotunda Hospital, Dublin.

Without doubt the most important practical result of the teachings of Sir James Simpson is this, that we do not now hesitate to dilate the uterus and investigate the condition of its interior, when symptoms indicative of serious mischief within the organ require us to do so.

I am well aware that by some practitioners the dilatation of the uterus is still looked on with dread, and that the attempt, if made at all, is undertaken with the greatest hesitation. I can only say that I believe these fears to be groundless, and that, if due care be taken to select suitable cases, and proper methods of carrying out the process be adopted, the treatment is a safe as well as a justifiable one. My own experience in the dilatation of the uterus has been great. I have practised it very frequently indeed during the last ten years, and as yet in no single instance has a bad symptom followed, nor have I even once been compelled to abandon the attempt. But I am far from throwing doubt on the accuracy of the statements made by others, who have recorded the occurrence of alarming symptoms, or even of death, as consequent on the attempt to dilate the cervix uteri; and I am quite prepared for the possible occurrence of such, for all are aware that cases must occur in which the most trifling exciting cause will be followed by

serious symptoms, though no grounds existed beforehand for anticipating the occurrence of such. But these are exceptional, and I believe, as a rule, that when serious symptoms arise, either during the process or in consequence of dilatation of the cervix uteri, they do so either because an unsuitable subject has been selected in whom to practise the treatment, or an unwise method adopted for carrying it out. On examining the records of the cases in which serious or unpleasant symptoms followed the attempt to dilate the uterus, I find they have generally occurred when practised,

1st. Either for the relief of dysmenorrhœa depending on the existence of a narrow cervical canal;

2nd. When the cervical canal is encroached on by a fibroid of large size and unyielding structure;

3rd. When the process has been attempted to be carried out rapidly by means of metallic dilators, or,

4th. When it has been protracted over several days.

I have therefore, in order to guard as far as possible against the serious results recorded by others as following attempts to dilate the uterus, laid down for myself the following rules, which I can recommend with confidence to others.

1. Never to dilate the cervix uteri for the cure of dysmenorrhœa or sterility depending on a narrow cervical canal or conical cervix.

2. Never to dilate in cases in which a large and dense intramural fibroid presses on and partially obliterates the cervical canal.

3. Never to use metallic dilators of any kind, but to choose for the purpose either sponge or sea-tangle tents, which expand slowly and gradually.

4. Never to continue the process of dilatation for more than forty-eight hours. I prefer, in the few cases I have met with in which, after the lapse of that time, the cervix was not sufficiently opened to suit the purposes I had in view, to postpone all operative interference for some weeks, rather than risk the result by prolonging the dilating process.

With respect to the first of these rules, I look upon the treatment of what is termed "mechanical dysmenorrhœa" by dilatation as being altogether a mistake. I doubt if any permanent benefit has ever resulted from it; while in several cases grave symptoms, and in one death, have to my knowledge followed the attempt. Equally, it is of importance not to prolong the dilating process. My own experience in the treatment of uterine disease requiring dilatation leads me to this conclusion, that unpleasant symptoms are likely to occur in a direct ratio to the length of time over which the process of dilatation extends. Again, I have known death to follow the

attempt to dilate the uterus in a case where a large fibroid of dense structure, giving rise to menorrhagia and causing intense pain, was developed in the uterus, and encroached on the cervical canal. In such cases, dilatation is doubly objectionable, because the process is useless as well as dangerous: useless, because you will generally find that any attempt at operative interference from the interior of the uterus will be impossible; and dangerous, because inflammation is liable to follow, and that too in patients in the worst possible condition for resisting the attack.

Hardly second in importance to the knowledge that the uterus may be with safety dilated to an extent sufficient to enable us to remove large tumours, is the fact of which we are now certain, that remedies of even a powerful nature may, not alone with impunity, but with the greatest advantage, be applied to its interior. But at this point our knowledge becomes defective. Some practitioners prefer one, some another, agent, for intra-uterine application. It may be carbolic, chromic, or nitric acid, or iodine, or the solid nitrate of silver: but as yet there has not been, it seems to me, sufficient care exercised in watching the action of these various agents, or in recording the effects they severally produce. Hence we are without dicta on which to base our treatment, or to guide us as to the agent to be selected in the treatment of the various forms of disease requiring intra-uterine medication. It is evident that no one of them can be suitable to all cases. For myself, I prefer carbolic acid in mild, and nitric acid in severe ones; but I freely admit I have much to learn on this point, and I look to others to aid me with their experience in deciding this important question. But it seems to me that, as with the dilatation of the uterus, so it is with respect to the application of agents to the interior of the uterus: that a groundless dread prevails as to their use. Here, too, as in the former case, the treatment is safe if carefully conducted, and if only practised in suitable cases and at the right time. Thus, if a caustic be applied through a narrow cervical canal, trouble is likely to occur. Equally will it probably follow if the fundus be tender to the touch, and chronic inflammation present; but, if the tenderness be first mitigated, and the inflammation lessened or removed, the application will, in all probability, prove beneficial.

In the treatment of uterine fibroids, too, we have made progress, but not as yet to a satisfactory extent. This much we know for certain, that many such cases, if menorrhagia be not excessive or pain intense, are best left alone; and it is astonishing in how many instances, even where menstruation is profuse, this course proves to be a wise one, treatment being restricted

merely to what is absolutely necessary to prevent the flow being excessive. But, unfortunately, exceptions are of but too frequent occurrence; and how are we to treat these? The removal of large fibroids by abdominal section has been successfully practised, but the risk of life involved in the operation is great; and the attempt to remove smaller ones by means of the *écraseur*, after dilatation of the cervix, is, I can vouch from personal experience, a difficult and eminently hazardous process. Again, enucleation is tedious, unsatisfactory, and often dangerous.

We have, however, at our command a resource which, if not all that we desire, is still generally efficient in controlling hemorrhage, often sufficient to arrest the growth of the tumour, and sometimes apparently capable of reducing its size. I allude to the hypodermic injection of ergot, which, if it has failed in this country to produce the almost marvellous results ascribed to it by Hildebrand, is, if properly carried out, a safe, as well as an efficient remedy. In my first cases, the results obtained were not only uncertain, but unsatisfactory, for troublesome sores sooner or later formed at the seat of the injection. Of late, however, I have obtained much better results. In not one of ten cases recently under my care, in which I fairly tested this treatment, has the hypodermic injection of ergot been followed by the formation of an abscess or sore; in all it had more or less effect in restraining hemorrhage; in one, the injection was repeated almost daily for five months, with the effect of absolutely restraining excessive menstruation, but with no other beneficial result, for the bulk of the tumour remained unaltered, and the pain was as intense as ever. Still it was no small matter to have transformed a profuse and exhausting flow, which formerly lasted for twelve or fourteen days, into one of moderate character and of but two or three days' duration. It is evident, then, that in ergot, employed hypodermically, we have a powerful agent, one capable of exerting a marked influence on uterine fibroids, but still uncertain in its action, and not altogether to be relied on.—*British Med. Journal, Aug.* 12, 1876, *p.* 204.

92.—MODIFICATION OF HIGGINSON'S SYRINGE FOR VAGINAL USE.

By Dr. T. M. Lowndes, Egham Hill, London.

The ordinary posture, in using vaginal injections, is very inconvenient to females suffering from uterine derangements.

1. The posture is a constrained one, and cannot be remained in for a sufficiently long time to allow the fluid injection to cleanse

way the *debris* from every part of the vagina, and produce its full effect.

2. The womb, in the half upright position of the body, is forced down lower than natural, and so prevents the full effect of the injection.

3. In many irritable and inflamed conditions of the womb, the use of the ordinary syringe is quite inadmissible without the assistance of a skilled assistant or nurse, and totally so in the ordinary position.

About fifteen months ago, Messrs. Maw, of Aldersgate Street, made, at my suggestion, an addition of two and a half feet in length to the exit pipe of the ordinary Higginson's syringe, and a soft India-rubber nozzle five inches long, perforated with a number of holes for vaginal injections. The end to be introduced into the vagina is closed and rounded, and the open end slips over the ordinary bone or ivory rectal end. It is used as follows. The patient lies in bed, with the nates placed over a bed-pan, and the vaginal portion is introduced, the basin or reservoir being placed at the bedside, on a small table at or a little above the height of the patient's body. The suction pipe (weighted, if necessary, with a small piece of lead of two or three ounces to prevent its coming out) is placed in the reservoir, and the ball squeezed in the ordinary way, so as to charge the instrument with fluid, and then the whole tube, if the reservoir be placed above, acts as a syphon, and the injection is thoroughly applied without the least exertion or discomfort of position on the part of the patient. If it be intended to apply the injection for an interrupted time, the basin is placed lower, and the injection made by squeezing the ball at intervals. In either case, the flow from the vagina is received in the bed-pan. This mode of injection is particularly useful in irritable states of the vagina, &c. I have no hesitation in saying that, since I used this very simple and inexpensive form of syringe, I have had very much better and more appreciable favourable results from the use of vaginal injections.—*British Medical Journal, July* 1, 1876, *p.* 9.

93.—ON THE USE OF THE TOW PESSARY.

By Dr. S. Butler Mason, Pontypool.

A woman between forty and fifty years of age consulted me about eighteen months ago for what she called "a falling of the womb," which had existed for upwards of ten years, and was at this period so distressing that she was a misery to herself and those about her. More than one medical man had supplied her with an apparatus to keep it up, but each and every one had miserably failed. At the time of my visit she was

wearing an arrangement consisting of numerous straps attached to a belt, all to no purpose. On examination I found her to be suffering from an elongation and hypertrophy of the cervix uteri, which extruded through the orifice of the vagina, bringing down with it the anterior and posterior walls, forming a mass which hung between the thighs as nearly as possible the size of an ordinary tumbler; and from the friction of her linen, &c., an ulcer the size of a two-shilling piece had eaten through the mucous membrane of the posterior wall of the vagina. My patient had gone from bad to worse, until she was obliged to remain in bed. I advised the usual operation for the removal of the cervix uteri, and afterwards narrowing the outlet by paring the edges as in the operation for ruptured perineum—in fact I pressed the matter strongly, but without being able to induce my patient to submit. I felt convinced that it would be useless to try the ordinary pessaries, as it would have been impossible to have kept any one of them in the vagina, in consequence of its relaxed state. I resolved to try the tow pessary as recommended by Dr. Edward Copeman, and accordingly introduced a quantity of cotton-wool into the vagina, after reducing the prolapsus. The result was most marvellous: my patient in the course of a few days was able to get up and perform her usual household duties with ease. She has rapidly improved in health, and says she is now more lithesome than she has been the last ten years. She introduces the cotton-wool herself night and morning, and makes the old straps useful as supports to her perineum, first placing a folded napkin to the parts. The cotton-wool or tow in no way interferes with the natural evacuation of either the bowels or bladder.—*Practitioner, July* 1876, *p.* 36.

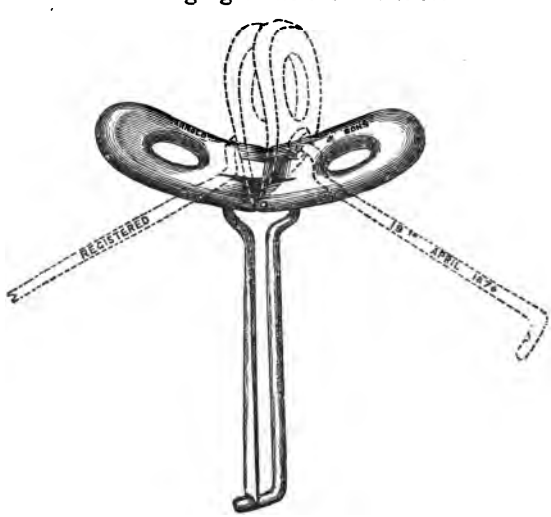
94.—AN IMPROVED FORM OF PESSARY.

By Dr. CLEMENT GODSON, Assistant Physician-Accoucheur to St. Bartholomew's Hospital.

In the treatment of diseases of women among the poorer classes, we meet with a large number of cases, for the relief of which Zwanke's pessary is the best adapted. I allude to those in particular in which the uterus has been completely procident for a length of time, where there is an absence of support in the soft parts, no fat, and frequently but little or no perineum. All the varieties of Hodge's pessary (especially Greenhalgh's improved form with bars) are tried; but directly any force is exerted upon them by straining or coughing, they are immediately expelled, and the only pessaries which are likely to be retained, are either the trumpet-shaped, with braces attached, or Zwanke's. The former is, as a rule, strongly objected to by the

patient on account of the braces; while the latter is almost always declared free from discomfort, and there is none more popular among this particular class of women. But every variety of Zwanke's pessary hitherto in use has its objection. Speaking of them as a body, it is said they are dangerous, as liable to give rise to pressure upon the soft parts, causing fistulous communication with the bladder and rectum. Such is certainly the case if they be left in for any length of time without removal, but such a complication is impossible if, as should always be directed, they be removed each night after retiring to bed, and replaced in the morning before rising. The real objections are, however, with regard to the material of which the pessaries are constructed, and the mode of fastening. [First, there is that form which is kept together by means of elastic tubing. This is the most objectionable variety of all, though largely employed on account of the price. The india-rubber is sure to split sooner or later; and, under any circumstances, it becomes full of and sodden by the secretions, and therefore, extremely fœtid.

A better form is that made of vulcanite, which is fastened by means of a screw, but it is frequently broken by being over-screwed. The discharge get into the interstices of the screw,



and it cannot be released, and often the adjacent hairs get entangled, giving rise to considerable pain; and so Zwanke's

pessary with many has fallen into disuse. To obviate these objections, I have contrived a form of Zwanke's pessary, which has been manufactured for me, and registered by Messrs. Arnold and Sons, of Smithfield, and it has already proved to be a very useful pessary. It is shown in the accompanying illustration.

The upper part is made of vulcanite, and is extremely cleanly, light, and durable. The lower portion or feet, employed for locking, is made of metal. Directly these feet come into contact, with the slightest pressure they lock, and they are as easily released by pressing with one finger upon the spring, and at the same time pushing the curved extremity down with the thumb. It may be suggested, that this portion will give pain by pressing externally, but this in practice will be found not to be the case. The patient walks about and sits down with perfect comfort. The expense—a very important item—is very little more than that of the cheapest form, while it will last out at least three or four of these. It is considerably cheaper than those varieties worked by means of a screw, whether made of vulcanite or metal.—*British Medical Journal, Sept.* 16, 1876, *p.* 360.

95.—AN EFFICIENT AND SIMPLE PESSARY FOR PROCIDENTIA UTERI.

By Dr. James Braithwaite, Leeds.

I quite agree with Dr. Clement Godson's remarks upon the utility of Zwanke's pessary in procidentia uteri, but consider that a far simpler instrument than the one he describes, and equally efficient, can be made of boxwood in one piece. I keep a gutta-percha model, and get the boxwood pessaries made from it at the small cost of eighteen-pence each. Nothing can be simpler than this instrument, as there is no metal to corrode, and no joint or hinge. I think the projecting portion should not be made so long as it usually is, and its terminal half should be rather bulbous. It is peculiarly useful in hospital practice, as it cannot get out of order, and never wears out. The use of a little sand-paper may be required at long intervals to keep the surface perfectly smooth. It is very easy to introduce, and the patient, if intelligent, readily learns to withdraw it at night and replace it in the morning. It should be washed on removal, and kept in water during the night. In cases of procidentia, its use should be preceded by that of the tow-pessary for a week or ten days, or until the perineum has regained its natural power. It seems incredible to those who have not actually tried it, that such an instrument can prevent the uterus from falling out, for it is itself less in superficies than a plane drawn through the widest portion of the procident uterus covered by

the inverted vagina. The reason is, that it does away with the wedge-action of the latter, and substitutes a flat surface, below which the perineum contracts, instead of being gradually expanded and pushed back, as it is by the wedge-shaped uterus.—*British Medical Journal, Sept.* 23, 1876, *p.* 395.

96.—TREATMENT OF THE AFFECTIONS OF THE VAGINA OCCURRING IN DIABETES.

By Professor F. WINCKEL.

Prof. Winckel makes the following observations on fifteen cases of disease of the external genitals occurring in patients suffering from diabetes. In the pruritus vulva accompanying diabetes he invariably found one of these forms of disease. Either 1, the slightest form, which is simply mycosis labiorum, or 2, furunculosis labiorum, or (3) lastly, which is the most frequent and obstinate form, a phlegmonous affection of the whole vulva, mons veneris, inguinal fold, sacrum, and nates. Professor Winckel is satisfied that he formerly frequently treated case of obstinate vulvitis without effect, having taken no pains to ascertain whether his patient was affected with diabetes, but he now never meets with a case of chronic erythema of the vulva without immediately instituting an examination of the urine. The severe form of diabetic vulvitis presents features so characteristic, that it can be diagnosed with a little practice by the mere aspect of the case. The parts are of a dark red colour and considerably swollen, and not always uniformly but in a knot-like manner. The redness and swelling do not disappear on pressure. The secretion is often inconsiderable, which distinguishes this form of disease from scrofulous vulvitis. From scratching and rubbing, however, the parts become moist, giving them a malign aspect. The disease creeps inwards and the vagina becomes hyperæmic. The appearance of a fungus first supervenes as a complication after the occurrence of the vulvitis, and it is only seen when the soil has, so to speak, been prepared. The affection is not, however, due either to the fungus, or to the constant wetting of the parts with urine, or to the circumstance that the latter contains sugar; but it is, according to Winckel, essentially a phlegmon associated with diabetes and consequent on an impoverished state of the blood. In regard to the treatment, the primary disease (the diabetes) must be first attended to, and for this, the Carlsbad waters will be found very serviceable, but local treatment must not be neglected. The best means in Winckel's hands have been copious and frequent ablutions of all the parts with a solution of 1 part of salicylic acid in 300 of water, but lead lotion, zinc ointment, white precipitate ointment, glycerine and tannin, Sitz baths with bran,

carbolic acid, &c., may also be tried.—*Practitioner, Sept.* 1876, *p.* 200.

97.—ON THE STRUCTURE OF THREE CERVICAL POLYPI.

By Dr. C. E. UNDERHILL.

In order to understand the nature of these growths, it is necessary briefly to consider the structure of the mucous membrane covering and lining the os and cervix uteri. In this description I have followed Tyler Smith and Farre; most of whose statements I have been able to verify by my own observations. The os and cervix uteri may for purposes of description be divided into two parts, which differ very materially from one another in structure; the one comprising the os uteri and external portion of the cervix, the other the mucous lining of the cervical canal.

The epithelial layer covering the external aspect of the cervix is of considerable thickness, and is squamous in character; it closely resembles that of the vagina, with which it is continuous. Immediately beneath the layer of epithelium lie the numerous villi or papillæ. These villi are sufficiently large to be seen with the naked eye when denuded of epithelium, and I have observed them in this condition even in the very young fœtus —they are occasionally single, but sometimes two or three are united together upon one pedicle. Each villus contains a looped bloodvessel, which returns to the base of the villus and inosculates with those of the neighbouring villi. These villi are everywhere covered by pavement epithelium, which also fills up the interstices between them, rendering the external surface smooth; around the bases of the villi the epithelial cells are more numerous, crowded, and narrow than in the interstices. It will be observed that the mucous membrane of this part bears, in its anatomical formation, a strong resemblance to skin, with the exception that it has no hair follicles, and no structures resembling sweat glands; indeed, as Tyler Smith points out, it is difficult under the microscope to make out any distinct follicular structure. Underneath the villi is a dense fibrous and vascular tissue, mixed with involuntary muscular fibres.

The mucous membrane lining the cervical canal differs materially from that just described, and the transition is accomplished by the presence of a small tract of smooth surface lying between the margin of the lips of the os and the beginning of the rugæ; this portion combines the pavement epithelium and villi with mucous follicles, the epithelium being finer than that outside the cervix, but the villi considerably larger. On passing further into the cervix the epithelium

changes in character from pavement to columnar, eventually becoming ciliated in the upper part of the cavity, and the villi soon disappear and give place to the penniform rugæ and the mucous follicles which cover them; these mucous follicles being lined throughout their ramifications with columnar epithelium. The viscid transparent mucus which fills them sometimes remains *in situ* even after the cutting and washing of sections.

Such being the normal structure of the mucous membranes of the os and cervix uteri, we should expect to find it reproduced in an exaggerated form in the tumours which grow from its surface. The first of the polypi I am about to describe was removed by Dr. Matthews Duncan, in March, 1875, from the os uteri of an unmarried woman aged 76, who also suffered from prolapse of the uterus. The polypus, which was $1\frac{1}{4}$ inches long by $\frac{3}{4}$ inch across, was attached to the edge of the os by a narrow pedicle; the free extremity terminated in several spire-shaped points, rising from the mass of the polypus; it was smooth, not very firm, and had several apertures leading into its substance. It was hardened in Müller's fluid and absolute alcohol, and sections were then cut. The sections of the body of the tumour and the spire-like processes all presented the same structure. Under the microscope, the external covering was found to consist of a closely-packed layer of very large papillæ, each papilla containing a bloodvessel; covering them and filling the interstices between them were pavement epithelial cells of various shapes. The lowest cells are mostly rounded in form. Succeeding them, and forming the great bulk of the tissue, were cells of large size and spindle-shape, being attached to the villi in a direction oblique to their axes, and giving an isolated villus somewhat the appearance of an ear of corn. The outermost layers consist of rounded cells, becoming more and more flattened as they approach the surface; there is, however, no distinct flat layer corresponding to the epidermic layer of the normal cervix. All these epithelial cells, of whatever shape, possess very large granular nuclei. Some parts of the surface showed a few collections of cells closely resembling the nests of epithelioma. At one or more points in the circumference of each section the depressions mentioned above are seen to lead into crypts of considerable size, into which project villous processes covered with a layer of large oblong-shaped cells, which are transparent, and do not take the colouring matter. Their length is several times greater than their breadth. These crypts vary in depth and outline, according to the direction in which they happen to be cut; some showing a simple deep depression, with three or four projecting papillæ, others ramifying in an irregular and extensive manner. At the edge, where these crypts open upon the general surface of

the tissue, the cells covering the villi can be seen to chan from the squamous to the cylindrical type. The interior of t tumour is made up principally of connective tissue, contain a number of bloodvessels of considerable size, and bands fibrous tissue pass across it in different directions. At so points near the base of the papillæ are large groups of rou nuclei.

This appears to be an example of a form of mucous polyp denser than such polypi usually are, and to have sprung fr the edge of the os uteri, leaving, as it does, combined the ch racters of the mucous membrane of the exterior and interi aspects of the cervix.

The second and third polypi were removed together from patient, whose history makes them particularly interesting I have described them both, because they differ from o another in some important particulars. The case is as follows —Isabella Turnbull, aged 69, was admitted into the Roy Infirmary, under the care of Dr. Matthews Duncan, in April 1875, and, on examination, the following report was made: "The speculum shows a patulous state of the cervix, it bleeds easily, and the finger discovers the anterior lip slightly pro jecting. The posterior lip is covered with small hard promi nences. The diagnosis was epithelioma in an early stage, and the cervix was cauterised freely with potassa fusa." The patient soon after left the Infirmary. She was re-admitted on 13th January, 1876, when she stated that, since she had been in before, she had suffered from a constant buff-coloured fœtid discharge. On vaginal examination the feeling of epithelioma was entirely gone, but two small polypoid excrescences were seen hanging from the cervix, and were removed by the scissors. The operation was followed by slight hemorrhage, which was easily checked. The discharge was seen to run from the cervical orifice, and a probe, introduced with much difficulty into the uterus, appeared to pass for a long way up. The diagnosis was, that probably there was some form of malignant disease within the cavity of the uterus.

The first of the polypoid growths was three-quarters of an inch in length, about the thickness of a crow-quill, and tapering to a point. The second one was about as long as the first, but considerably broader and flatter. I shall call them No. 2 and No. 3.

On cutting into No. 2, the section was white and somewhat lustrous. In the centre was a cavity of considerable size, filled with blood. Under the microscope the sections were seen to be surrounded with a layer of dermal tissue, composed of papillæ of various sizes, covered by a layer of epithelial cells, resembling those of the cutis vera, and terminating at the surface in a well-

marked, tolerably thick, layer of epidermic flattened cells. Beneath these, the cells were first irregularly flattened, then more uniformly round; and from the point where the round shape was assumed, as far nearly as the base of the papillæ, they presented in a well-marked form the prickly appearance so common in cells of skin and epithelioma. These papillæ, and the cells covering them, form a layer of very considerable thickness, surrounding the greater part of the growth. At one point in the circumference the papillæ and cells have undergone a great change; they are no longer to be distinguished as separate parts of the tissue, but are all blended together in a crowd of large round and spindle-shaped cells, which take the carmine very deeply. They are still separated by a distinct outline from the subjacent tissue, which has also undergone a change in character.

The greater part of the interior of the growth is made up of fibrous and connective tissue, containing a few bloodvessels, which, as we near the degenerated spot, become more numerous and larger. Here, also, the normal connective tissue is found to be infiltrated with great numbers of rounded nuclei, which gradually increase in numbers until, under the degenerated spot at the surface, the normal tissue is entirely replaced by them. Even at the most densely crowded part a fine, trabecular fibrous stroma can be made out. No mucous crypts are to be found in any part of the tumour.

This growth—which only deserves the name of polypus, inasmuch as it projected from the surface of the cervix, and was attached to it by a narrow base—appears to be an outgrowth of the mucous membrane covering the external aspect of the cervix. The arrangement of the papillæ and pavement cells at the surface correspond to the normal structure very closely. At one part, however, it is seen undergoing a sarcomatous transformation, a change of undoubtedly malignant character; and we shall see in No. 3 a further stage in the development of the disease.

The microscopic appearance of No. 3 differs very materially from the last described. It has no external covering of papillæ and pavement epithelium; no vestiges even of such a layer can be found. The free border is formed by a dense layer of the rounded nuclei, similar to those in the malignant part of No. 2, supported by a fine trabecula of fibrous tissue. As we pass deeper into the tissue these trabeculæ become more distinct, and can be seen at first as lines separating rows of nucleated cells from one another, and at length as forming a meshwork isolating single cells. These cells are evidently in a state of rapid proliferation. Some contain one, some two or more,

large nuclei, which stain deeply in the carmine. Lying among this cellular layer are numerous and large bloodvessels, with walls in many cases thickened and infiltrated with the sarcomatous cells. The great vascularity of the tissue is well seen under a low power.

The structure thus described is undoubtedly sarcomatous in character, and is to be classed as an alveolar sarcoma, rapidly developing a condition of telangeiectasis. In making out the nature of these growths I have had the able assistance of Mr. D. J. Hamilton, assistant to Professor Sanders.

These three growths come under neither of the two heads into which polypi of the cervix are usually divided, fibrous and mucous, though No. 1 is allied to the latter type. The principal point of interest in it is the size and number of the bloodvessels which its stroma contains, showing that the danger of hemorrhage, which has been described as occurring sometimes to an alarming extent when such growths have been cut off, has a solid foundation in fact. In a discussion in this Society last year it was pointed out, I believe by Dr. Keiller, that the hemorrhage resulting from removing mucous polypi by the knife was apt to be more severe than that from fibrous polypi.

Nos. 2 and 3 are invested with special interest by the history of the case, which, when the patient returned a second time for treatment, was a puzzling one. The appearances which gave rise to a diagnosis of epithelioma had disappeared, and the only complaint the patient made was that she had suffered from a constant discharge. The cervix and os uteri presented no appearance of disease excepting these small growths, and though the discharge was evidently coming from the interior of the uterus, the difficulty of introducing a sound into it precluded any further examination being made. Thus the examination of these growths formed a valuable aid to diagnosis by confirming the malignant nature of the disease, and clearing up the doubts which had arisen in consequence of the improvement in the external condition of the cervix between the time she came first under treatment and her subsequent return nine months later. It is interesting to note, that two growths, springing side by side at the same time, and from the same part of the cervix, should present so great a difference in microscropical appearance, and should represent such different stages of the disease; and I think we may draw from it the inference that if more than one tumour grow from the cervix, it is well to examine all before determining on the nature of the malady. —*Edinburgh Medical Journal, August* 1876, *p.* 105.

98.—ON THE DIAGNOSIS AND TREATMENT OF OVARIAN TUMOURS.

By Dr. J. KNOWSLEY THORNTON, Surgeon to the Samaritan Hospital for Woman and Children.

[Although we should be unwise to be guided too much in our diagnosis of ovarian tumours by an examination—microscopic and otherwise—of the fluid withdrawn by an aspirator, yet a considerable amount of assistance may be thus gained in doubtful cases. What is known as Drysdale's ovarian granule cell is perhaps the most characteristic microscopic test we have, but this is hardly absolutely diagnostic.]

I believe much of our future progress in abdominal surgery, so far as operation for tumours is concerned, depends upon a correct appreciation of the value of an accurate examination of the fluids obtained by tapping in distinguishing different cystic or peritoneal secretions and their more solid surroundings the one from the other.

To state as briefly as possible my experience on this subject I would say, if a fluid is more or less viscid, forms a considerable coagulum on heating, which coagulum is either entirely dissolved or turned into a transparent jelly by adding an equal volume of strong acetic acid, and continuing the boiling, this fluid is probably from an ovarian cyst.

This is a test suggested to Mr. Wells for distinguishing between ovarian and ascitic fluid by the fact discovered by Scherer, that par-albumen is soluble in strong boiling acetic acid, whereas albumen is not.

If a clear bright or pale yellow fluid, which is not viscid, forms a dense white or whitish-yellow coagulum on heating, which is often somewhat yellowed, but not dissolved, by boiling in excess of strong acetic acid, it is probably ascitic.

If a fluid is clear like water, or slightly opalescent, of low specific gravity, forms little or no coagulum on heating, but often becomes markedly turbid if a few drops of acetic acid are first added, and then quite clear again with more acetic acid and more boiling, it is probably from a broad ligament cyst. If it is a viscid yellowish fluid, forming with heat a coagulum which is only partially dissolved or gelatinised by boiling with excess of strong acetic acid, it is probably a mixture of ovarian and ascitic fluid. Ascitic fluid, in cases where a malignant abdominal tumour is present, and causing its presence, is apt very closely to simulate a mixed fluid, but I shall be able to point to other differences between them.

These are rough tests which I frequently employ by the bedside of the patient, and I find that when in any doubt, I can, with the other symptoms of the case, frequently decide cor-

rectly as to its nature; but I should never venture an opinion on them alone, and am often not aided at all by them, and am glad to fall back upon my microscope. What aid then, can it afford? First, it shows us certain elements in the fluids, which may help or confirm diagnosis in a doubtful case. Second, it shows us the structure of the solid parts of tumours, and aids us materially in deciding as to their simple or malignant nature. I have already mentioned the ovarian granule of Drysdale. It is a little round delicate cell, full of brightly refractive granules, the cell varying somewhat in size, but commonly about that of a white blood corpuscle; it may be distinguished from the latter and lymph corpuscles by its resisting the action both of acetic acid and ether, neither making any distinctly perceptible change in its appearance, except that the former renders the granules, which are irregularly scattered throughout its interior, rather more distinct. Besides this granule cell, ovarian fluids commonly contain a few blood cells in various states of change, and some larger brown or yellowish granular aggregations, which appear to have no investing membrane. Other common objects found are the cholesterine crystals, single or in masses; in some fluids they are very abundant. More rarely one finds certain single cells and pieces of small columnar epithelium; and in still fewer cases, to which I shall again refer, certain peculiar groups of round and oval cells aggregated in clusters and containing many nuclei or small cells in their interior and vacuoles. Other rarer cell-forms are seen, but those I have mentioned are sufficient to recognise in the great majority of cases.

In the fluids from broad ligament cysts one rarely finds any element on microscopic examination, and if any, usually only here and there a single roundish dimly granular epithelial cell.

It is very different, however, when we come to examine peritoneal fluids, for here we find the most remarkable and characteristic cells and cell-groups. I have not had many opportunities of examining ordinary ascitic fluids in cases of hepatic cardiac or renal diseas, but in the few I have examined I have never found anything but a few red and white blood-cells, and a few larger granular nucleated cells, having the appearances one would expect to find in chance free cells from the endothelium lining the peritoneal cavity. It is when we come to examine peritoneal fluids which have been poured out round an abdominal tumour, however, that we find various groups of cells, which it is impossible for me to describe in detail here. Suffice it to say that I believe they are of the utmost importance for us to study, and often furnish most valuable aid in diagnosis. I send round drawings of some which will, I feel sure, do more than any lengthy description towards convincing the members of the Society, that they are sufficiently charac-

teristic. My friend Dr. Foulis, of Edinburgh, claims to have been the first to describe some of these, which he considers affords certain evidence of the malignant nature of the tumour if it be ovarian. I will not dispute with him the satisfaction of being the first to draw attention to this important subject, but I cannot quite agree with him as to their always indicating malignancy when present with an ovarian tumour, as I have found them in the peritoneum when irritated by rupture of an ordinary ovarian cyst, and Dr. Keith tells me he has operated on patients with the nodular growths (from which, I believe, these cell-groups are shed) covering the peritoneal surfaces, and yet the patients have remained for years after in the enjoyment of good health. I have also found them with malignant disease of the uterus, liver, and omentum. I believe these groups to be of two kinds; the one consisting of masses of germinating endothelium; the other of masses of germinating or proliferating cells, derived, not from the endothelium, but from the ground substance of the peritoneum. Various forms will be seen depicted faithfully in the drawings, some looking like mere clusters of lymph corpuscles (like bunches of grapes), others like more or less flattened endothelial plates arranged in layers, and others presenting every variety of size and shape, and every stage of growth. It is these latter to which I attach the most importance as indicating malignant disease, and under this term I include both the rapidly growing sarcomas and carcinomas and certain peculiar ovarian papillomata. I have great hopes that careful study will enable us to diagnosticate by these *groups* not only the presence of malignant as differing from simple tumours, but also the special forms of tumour. I would say here that I believe the presence of any large collection of ascitic fluid round an abdominal tumour is always strongly suggestive of malignancy, but whether its presence is merely due to irritation of the peritoneum by rapid growth, or to some more direct infection, I think is at present uncertain. The *occasional* presence of a considerable quantity of ascitic fluid, along with a simple uterine fibroid or simple ovarian tumour, points to the former hypothesis as correct; and the presence of the groups of cells I have been speaking of, along with ascites in malignant disease, and their absence in simple ascitic fluids also favours this view. The colouring of the ascitic fluid with blood, along with these cell-groups, I believe is a certain indication of malignancy, though, even where this symptom is also present, we see very different degrees of malignancy, as judged by the time the patients may live in tolerable comfort if occasionally relieved by tapping.

In the Medical Times and Gazette, April 10, 1875, I drew attention to the presence of these cell-groups, together with

certain other microscopic elements, as indicating papillomatous growth inside ovarian cysts, and stated my belief that any cyst known to contain this papilloma should be at once removed, as the escape of these cell-groups into the peritoneum may cause general infection. Since publishing that paper I have seen more than one case confirmatory of that view, and I have just had an opportunity of examining post-mortem the liver of a lady whose cyst I feel sure contained papilloma—my opinion being formed from more than one careful examination of the fluid obtained by tapping. The case was not considered a suitable one for ovariotomy, and was treated by vaginal tapping and drainage, and the patient died of malignant disease extensively infiltrating and much enlarging the liver. I cannot at present accurately describe the growth, but I have examined it sufficiently to satisfy myself of its relation to that found in the remains of the cyst. A similar case is reported in the last edition of "Wilks' Pathology" by Moxon.

Papillomata occupy a most interesting position on the border-land between simple and malignant tumours, and when their history comes to be completely written I expect much valuable information as to the pathology of malignant tumours will be brought to light.

It will be seen from what I have said, as well as from the drawings I have sent round, that these cell-groups may be found in ovarian cysts which, if removed early, are simple tumours, and that I also regard them in certain peritoneal fluids as evidence of malignancy. This at first sight appears a contradiction; but it is not so, for, once free in the peritoneum, I have ample evidence to prove that they become clinically malignant, because universal papilloma of the peritoneal surfaces results. And though the growth is a slow one, and, as I have said, on the border-land of malignancy, it does eventually kill, invading, by infiltration, intestines, bladder, &c., and even appearing in the liver itself. The presence of these cell-groups in both simple ovarian cysts and peritoneal fluids with malignant tumours might appear to render them valueless for diagnostic purposes; but this is not the case, for when we subject the fluids containing them to the rough tests I have mentioned, and to further microscopic examination, we have no difficulty in distinguishing between them. Indeed, as I have already said, I believe further time and opportunity for the study of this subject will reveal distinctive characters in the cell-groups which will materially aid us in distinguishing the kind of tumour causing their presence in the peritoneal fluid,

I might say much more on this subject, and bring forward interesting cases in support of my views, did time permit. The

contents of dermoid cysts are generally quite characteristic, both to the naked eye and microscope; but it is seldom of importance to distinguish between a dermoid and ordinary ovarian cyst before operation. The following diagnosis, founded in a doubtful case on the examination of the fluid procured by tapping, and confirmed by exploratory incision, may serve as an illustration of this subject:—

1. The fluid examined comes—in part, at any rate—from an ovarian cyst.
2. The cyst, or cysts, contain papilloma.
3. Some inflammatory action has been going on in the lining membrane of the cyst.
4. From the great variety and large size of many of the cells and cell-groups, the growth is probably free in the peritoneum.
5. Some admixture of ascitic fluid is also rendered probable by the appearance and chemical reaction of the fluid.

The case was one in which it was very difficult to decide whether there was a solid tumour, or tumours with ascitic fluid, or whether it was a case of ruptured ovarian cyst; and Mr. Wells thought an exploratory incision advisable. The incision brought to view a large ruptured cyst, with papilloma growing out of it, and similar papillomatous growths from the peritoneal surfaces, with extensive deposits of lymph on the cyst-wall, and the wound was at once closed. Mr. Wells kindly showed the above report on the fluid to those gentlemen who were present. The patient recovered, and is still alive, more than a year after, thus affording evidence of the slow malignancy of the growth.—*Medical Times and Gazette, May* 13, 1876, *p.* 519.

99.—PUERPERAL FEVER AND SEPTICÆMIA: THEIR RELATION AND PROBABLE IDENTITY.

By Dr. GEORGE HUNTER, Linlithgow.

During the months of March and April of this present year, it was my misfortune to have in my midwifery practice several cases of the so-called puerperal fever; and these occurred under such circumstances, and were followed by such singular and disastrous consequences, especially to those in immediate attendance upon them, that it has been deemed matter of sufficient interest to bring under the notice of this Society a brief account of each case.

It is always with diffidence that the general practitioner publishes cases of puerperal fever; for he almost invariably has to record a fatal termination to the most carefully considered treatment; and the public mind being so awe-stricken at the

very mention of the name, he runs no inconsiderable risk of loss of reputation, and certainly of loss of patients for many months to come.

But as I believe our acquaintance with the pathology of this disease—which might justly be denoted the "*opprobrium medicinæ obstetricæ*"—and our knowledge of its prevention and treatment may be advanced by the history of such series of cases being recorded, I do not hesitate to undertake the responsibility of having done so.

Before entering upon the consideration of my obstetric cases I must refer to some other ailments which prevailed to a slight extent amongst my patients early in the spring of this year.

Mr. Y., aged sixty, pricked his right thumb with a rusty knife early in January. This was followed by most serious constitutional disturbance, rigors, fever, temperature ranging from 102° to 104°, perspirations, &c.; with extensive lymphangitis and suppurative cellulitis of the entire hand and forearm, and, to a certain extent also, of the upper arm. Cellular, fascial, and ligamentous structures sloughed, and bone necrosed; and the products of this necrotic action so affected his nerve-centres and his constitution generally, that his pulse became weak and irregular, the apex of one lung hepatized, diarrhœa set in, and his life appeared to be in jeopardy. The thumb was amputated; abscesses in the forearm, and in the palmar and dorsal aspects of the hand, were evacuated, and drainage-tubes inserted. After a most tedious course of treatment—locally by antiseptics, and generally by tonics and nutrients—he is now almost well, the sinuses being almost closed; but the hand is stiff at the wrist, and the fingers are considerably flexed.

In the course of the surgical treatment it was noticed that the tissue débris, sloughs, and purulent matter removed by pressure, and in syringing the sinuses and drainage-tubes, smelt very offensively; and that, notwithstanding the very careful and diligent use of antiseptics and nail-brush, an unpleasant odour of the dressings was persistently exhaled by the fingers. I may here mention that the antiseptics employed in this case were carbolic acid, chloride of zinc, lotion and ointment of chloral, iodine, and boracic ointment and lotion.

Towards the end of January, Mrs. Y., wife of the preceding, was seized with a rather severe attack of erysipelas of the head and face, but made a good, though somewhat tedious, recovery. Two other cases of erysipelas occurred in my practice about this time: one of the head and face, which proved fatal on the sixth day; the other supervening on the eschar of a cautery wound on the right knee, for disease of that joint. This case was a serious one, and was attended with severe constitutional and local action. The temperature rose to 104·5°; pulse to 120 to 130;

the upper third of one lung became dull on percussion; the brain weakened; and the mental depression and distress were painful. The erysipelatous inflammation spread to the opposite limb, to the lower part of the abdomen, and over the sacrum. A very large collection of matter formed over the right sacro-iliac synchondrosis, which discharged sloughs and offensive matter for a period of three weeks or more. It was dressed with antiseptics twice daily; but from its situation, and with the cautery wound on the knee, there was some difficulty in turning the patient from the dorsal to the lateral position (which was the only one in which the patient could be dressed with satisfaction); and the fingers of both hands were exposed to the contaminating influence of the abscess contents, and to a superficial suppurative action with which the posterior surface of the right leg, from the lower part of the thigh to the heel, became affected. This patient made a favourable recovery so far as the erysipelas was concerned, but is still under treatment for the affection of the knee-joint.

In the spring months, I had also under my care several cases of scarlet fever; but as a month seldom passes without bringing under my notice some cases of this complaint, I do not at present dwell on them.

Turning now to the obstetric cases, of which four died and two recovered, I cannot undertake to furnish a detailed account of their respective daily conditions, which I believe would prove tedious alike to the hearer and reader, but I shall take notice of the most prominent features and characteristics of each.

The first case affected with puerperal fever was that of Mrs. A., the mother of two healthy children, who aborted on the 23rd February, 1876, at the third month.

The hemorrhage was not by any means profuse, but the decidua required some rather tedious manipulation for their complete removal; and it was noticed that portions of them had an offensive odour. On the third day after parting with the uterine contents, she had a rigor, followed by severe pain over the uterine region, with nausea, frequent weak pulse, increased temperature (103°), furred tongue, and marked diminution of the lochial discharge.

From this time until 3rd March, when she died, the pulse became more frequent, ranging from 120 to 140, weak and thready; the tongue sodden and bile-stained, but not altogether dry; vomiting principally of bilious, but latterly of most offensive matter, with a slight stercoraceous fetor, severe and sustained; expression anxious, but mental faculties preserving their usual alertness; the abdomen increased in distension, with the intestinal convolutions distinct and flatus retained, until respiration became shallow and embarrassed; and then the fall

of temperature, with pinched expression, coldness of the breath, forehead, and nose, and icy feeling of the extremities ushered in the fatal termination.

Mrs. Z. having been engaged to be with Mrs. A. at her confinement, came to her as nurse when she aborted, and slept in the same room, on a bed quite close to, and almost alongside, her patient. Mrs. Z. was instructed and directed to make frequent vaginal injections and vulvar ablutions, which she carried out very carefully and satisfactorily, both with Condy's fluid and carbolic-acid lotion. She was almost in constant attendance on Mrs. A. during the night, and was seldom able to undress completely for the few hours she might be able to snatch while her patient was being watched by some of her own relatives.

Four or five days after Mrs. A.'s funeral (11th or 12th March) Mrs. Z. went home to her own family, which consisted of her husband, a man about sixty-six years of age, and an imbecile son of eighteen years.

Ten or twelve days after her return, her husband exhibited symptoms of virulent blood-poisoning. These were violent rigors, followed by fever, thirst, frequent weak pulse, which soon became irregular; profuse perspirations, dry brown tongue, delirium, diarrhœa, &c.

A swelling began to form in the right axilla, which did not appear to be acutely painful, and which gradually increased to the size of a melon or cocoa-nut at the time of his death. Some of the contents were removed by the aspirator and found to contain sanious purulent matter, serum, and tissue débris. The urine did not contain albumen, and there was no disease elsewhere.

The second case (Mrs. B.) was attended partly by my assistant Dr. Brown, who remained with her the night of the 22nd February; but she was delivered by myself on the evening of the 23rd of her first child, having been in labour upwards of forty-eight hours. On the morning of the third day, she complained of chilliness, and shivered the same evening. This was followed by pain over the hypogastric region, the arrest of the lacteal secretion (the breasts never contained any milk), and almost complete cessation of the lochia. The subsequent course of Mrs. B.'s case was in many respects identical with that of Mrs. A., and the vomiting was less severe. The duration of the illness was the same, for she also died on the 3rd of March.

The nurse in this case slept in an adjoining room, and was frequently relieved by some of the friends of the deceased.

The third case (Mrs. G.) was attended by Dr. Brown on the 7th of March in her fourth confinement. Labour was easy and natural, and nothing untoward happened until the evening of

the second day after delivery, when she complained of coldness of feet and shivering feelings passing up the legs and across the small of the back. Early on the morning of the third day she was seized with severe pain in the left ilio-hypogastric region, rigors, great frequency of pulse, vomiting, and other symptoms, which, with the flabby mammæ, and arrested or greatly diminished discharge, left no doubt in my mind respecting the dangerous, and I may say hopeless, malady with which I had to do. Death took place on the 13th of March, six days after delivery, and after only four days' continuance of the more serious symptoms.

The effects to those in attendance upon Mrs. G. were most serious, and to these I now wish to direct the attention of the Society.

Mrs. X., the mother of this patient, who acted as nurse, making frequent vulvar and vaginal cleansings and injections, was seized on the fourth day after her daughter's delivery with prolonged shivering, followed by fever, sickness, great thirst, quick pulse, and acute pain from the right forearm to the shoulder. On the following day the right shoulder was swollen, and the supra-clavicular, sub-clavicular, and axillary glands were enlarged and painful. This was succeeded by alarming constitutional symptoms, with great and severe prostration. The pulse rose to 120, and was frequently irregular, the tongue dry and brown, and there was much thirst, with great mental depression and apathy. To the lymphangitis there were superadded cold shiverings (more than once repeated) and perspirations, and ultimately suppuration of the affected glands ensued. After evacuation of the large abscess which formed at the outer border of the pectoralis major, the symptoms abated, and on the 4th May she was convalescent and gaining strength rapidly. The cicatrix of a slight injury to the dorsal surface of the right index finger, which had escaped observation at the time of its infliction, was now discovered, and Mrs. X. remembered her family calling her attention to it on her return to her own house immediately after her daughter's disease. It then resembled the small blister resulting from a burn, and was filled with white matter. The resulting cicatrix was the size of a shilling.

When Mrs. X. became ill, another daughter attended Mrs. G., and performed the duties of nurse until the latter's death. Three or four days afterwards, when in town shopping, Miss X. had a rigor, accompanied with a feeling of general illness and sharp pain on the dorsal aspect of the joint between the second and third phalanges of the right ring-finger. To much constitutional disturbance succeeded increasing pain, swelling and tension of the dorsal and palmar aspects of the hand, and brawny infiltration of the forearm, with red lines indicating the

course of the inflamed lymphatics. The local symptoms increased still more in severity, until there were uniform redness, swelling, and tension of the hand, of the forearm, and part of the arm, with painfully enlarged glands in the axilla. Free incisions were made over the dorsal and palmar aspects of the ring-finger and hand, which gave exit to a considerable quantity of serum and sanious pus. The lips of the wound remained gaping, in this respect resembling an incision into a piece of liver, and exactly like the incisions into the hand of Mr. Y., to whose case I have already alluded. Miss X. was now removed from the house of her sister in the country to town, when the greatest care was observed in dressing the hand antiseptically morning and evening, and fortunately, the finger was saved, although amputation at the metacarpo-phalangeal joint, or even of part of the hand, appeared at one time to be unavoidable. Recovery was tedious, there being much vomiting, anorexia, and despondency; but on the 4th June the wounds were completely healed, some stiffness and contraction of the ring-finger only remaining.

One of the servant-maids, who had washed some of the body linen soiled by discharges from the deceased, next became affected. She shivered and complained of headache and feverishness, and suffered from sloughy ulceration of the tonsils, with enlargement of the submaxillary glands. She was under the necessity of leaving her situation to go to her own home, and she thus passed from my observation.

Finally, Mr. G., a healthy young farmer, much out in the open air of his upland farm, was affected with general malaise, ending in inflamed tonsils, which, however, terminated in resolution after a short illness.

I discontinued obstetric practice from the 9th March to the 1st April, and went to the south of Dumfriesshire, where I freely exposed myself to the purifying influences of the ozone of the Solway Firth, and to the keen breezes from Skiddaw and Helvellyn. Before returning to engage in practice, I took a Turkish bath, made a complete change of clothing, and used the nail-brush, if possible, more diligently than before.

During my absence, the medical friend who had undertaken to attend obstetric patients for me, delivered six cases, and all did well.

From the 23rd February—the date on which the first two cases originated—until 9th March, when Dr. Brown and I discontinued practice, six women were delivered, five by Dr. Brown and one by myself, and all made good recoveries. But it must be mentioned that in three of these cases the child was born on my arrival at the patient's house; in one instance the labour was completed, and in the remaining cases labour was easy and natural.

On the 1st of April I again resumed practice, on which date I was called to three obstetric cases. The first was quite over on my arriving at the patient's house, and made a good recovery. The second had completed the second stage, and, having previously smeared the fingers of my right hand with carbolic oil, I extracted the placenta; she also made a fair recovery.

The third case, my *fourth* fatal one from puerperal fever, was that of Mrs. R., a healthy young primipara.

I used carbolic acid for the fingers of my right hand, and took the precaution to change my coat on my arrival having borrowed one from the husband for the occasion. In spite of all these precautions Mrs. R., shivered on the third day, complained of pain over the uterus, and had a slight tendency to diarrhœa.

The course of her case was in every respect similar to the others narrated; but the symptoms were not quite so acute, for death did not occur until 10th April. After the third day, thinking it better and safer for my other patients, I discontinued my visits, and Dr. Baird, my former partner, very kindly undertook the care of this case.

Mrs. X., who lived near at hand, came to be with her daughter at her confinement. She was constantly in the same room with Mrs. R., and, when the latter became seriously ill, slept in the same bed. On the second day (4th April) Mrs. X., who had been very anxious about her daughter, pricked the middle finger of the left hand with a pin when removing the binder, and on the third day became suddenly ill, with shivering, vomiting, and headache. At the time of my visit she had a pinched, earthy look, with hollow eyes, frequent pulse, and a tendency to retching and giddiness on walking. She was at once removed to her own house, and when seen the following day, she complained of pain in the left shoulder and axilla. On examination it was found that the axillary and subclavicular glands were enlarged and painful to the touch, and that the arm and forearm were swollen and inflamed. Soothing lotions reduced the latter, but the glandular affection increased in severity, and, on the 11th May, a breakfast-cupful of purulent matter was evacuated from an opening at the anterior fold of the axilla, and a considerable amount also from a second opening on the inner aspect of the arm, a couple of inches above the elbow. These two openings communicated, and on the 8th June a drainage-tube was introduced.

During the maturation of the suppuration in and around these glands, Mrs. X. was totally unable to leave her bed, and was subject to chills, followed by flushings of heat, generally ending in perspirations which caused much adynamia. Since

the introduction of the drainage-tube, and the more complete evacuation of the offensive discharge, appetite and sleep have returned, and she is now (28th June) convalescent.

A sister-in-law, who attended to Mrs. R. and the infant after Mrs. X.'s illness, and who slept in the same bed on the nights of 6th, 7th, and 8th of April, began at that time to complain of stiffness of one side of the neck when supporting Mrs. R. in bed, and, on the 10th or 11th (April), it was observed that the submaxillary glands of that side were much swollen and painful. An examination of the fauces made the nature of the case apparent, for it was then observed that there was ulceration of the tonsil, with the formation of white sloughing patches on it. Extensive suppuration of the affected glands ensued, and, on the 5th May, the abscess was freely incised, giving vent to a large quantity of healthy pus. She has not yet recovered her strength, and (28th June) still looks very anæmic.

A *second* sister-in-law assisted at the washing and dressing of the body of Mrs. R., and, in doing so, carelessly put one of the pins into her mouth. On the following day she assisted in washing some of the clothing of the deceased. The same evening she returned to her own home in a neighbouring town, and found that her throat was affected. She was confined to the house for some time, under the care of the local medical attendant.

Soon after the infant's birth (9th April), those nursing it observed an offensive discharge from the roots of the finger-nails of both hands. Care was taken to prevent the child putting its fingers into its mouth, and a carbolic-acid lotion having been applied, it soon made a good recovery.

A *third* sister-in-law became affected soon after the opening of the abscess in her sister's neck, with swollen, inflamed, and slightly ulcerated tonsils.

Next, the husband of Mrs. R. was seized eight days after the preceding with the acute tonsillitis, which, however, did not go on to suppuration, but ended in resolution.

Finally, the husband of Mrs. X., who had washed some of the bandages and rags soiled by the discharges from his wife's arm, was seized with erysipelatous redness and swelling of his right hand near the root of the thumb, and between it and the index finger. Under the use of local discutient and sedative lotions, it gradually disappeared without leaving any bad results.

The next case of puerperal fever was that of Mrs. V., who was delivered of her fifth child on the 4th April, after a natural but rather tedious labour. On the morning of the fourth day she complained of pain over the uterine region of a *constant* and persistent character, quite distinct from the "after pains."

she was then feverish (temp. 104°), pulse 118, with headache, thirst, &c. The mammæ contained a little secretion, and the discharge, though diminished, had not by any means ceased, and was not particularly offensive. Under the exhibition of mild aperients and diaphoretics, such as castor-oil and Dover's powder, the symptoms gradually subsided, and on the eleventh day her pulse and temperature were much lower, and her general condition favourable.

The last case which gave any anxiety was that of Mrs. W., who was delivered on the same day as the preceding case. On the evening of the third day she complained of headache, vomiting, thirst, and slight uterine pain; but there was no change in the lochial flow, which from the first had not been profuse. The lacteal secretion was long in coming, and she was drenched in perspiration. After being treated similarly to Mrs. W., she gradually improved, and made a good recovery, but was longer confined to bed than ever she had been before.

From this material, and in the light of these cases, we now proceed to consider the relation which may reasonably be inferred to exist between puerperal fever and septicæmia. But, before doing so, there are one or two preliminary questions, which, though of great importance and of deep interest to us as practitioners of medicine, can only be briefly alluded to and hurriedly disposed of; for though pertinent to our inquiry, they do not necessarily come within the scope of this paper.

The idea that puerperal fever is a specific disease—a fever *sui generis*—was almost universally accepted until quite recently. This view now finds few supporters; and, as the most distinguished authorities in obstetrics are opposed to it, I shall not take up the time of the Society with any arguments of my own or quotations from others, against it.

Regarding the connexion between the exanthemata, but especially between scarlet fever and erysipelas, much has been written; and, as the result of such writing, strong opinions have been stated and decided action taken. Dr. Braxton Hicks and Dr. Arthur Farre especially insist on the close connexion not identity, between scarlet fever and puerperal fever; and my own cases, and I am sure the experience of many members present, will give some support to the idea of such a connexion. But when we find women delivered with the bright rash of scarlet fever completely covering them (and on this point I have the positive testimony of Dr. Baird's experience of such a case making excellent recoveries; when we even find scarlet fever passing through the system of the mother, who was herself protected by a previous attack, and infecting the child in utero without serious consequences to the mother, as in a case recorded by Dr. Cordes, of Geneva; and when Hirsch and Veit

shown by statistics that there is no coincidence between the prevalence of the two ailments at the same time—we are forced to the conclusion that puerperal fever is not merely scarlet fever in the puerperal state. Further, in a disease like scarlet fever, one expects to find identity of result from identity of cause. If a scarlet-fever germ is planted, we do not expect to find measles, or typhoid, or anything but scarlet fever result. Too many cases are on record, however, showing the disastrous results that accrue to puerperal cases from contiguity to the poison of scarlatina; but may it not be that the vital power of the puerperal woman, having borne the burden and heat of the day of labour, and struggled with the physiological processes of lactation and uterine involution, find themselves unable to cope with the intrusion of this new poison, and so surely succumb to it?

Much and most reliable testimony has been given, and the evidence of competent observers adduced to show the intimate relationship, and even interchangeability between puerperal fever and erysipelas. I have adduced three cases having some bearing on this point. But the same arguments which were applicable in the case of scarlet fever here hold good. I shall quote three cases (with the Society's permission) which are, I think, decidedly *ad rem*, and which, in my opinion, render such a view untenable.

If it then be conceded that puerperal fever is neither a specific fever, nor erysipelas, nor scarlet fever; its probable identity with septicæmia only remains to be considered.

That the non-puerperal cases narrated, or the great majority of them, were those of undoubted blood-poisoning, must, I think, be readily admitted. A reference to their accession, course, and to the severity of the general and local symptoms —*e.g.*, in such a case as that of Mr. Y., together with the absence of any other feasible explanation, sufficiently indicate this.

I have previously stated that the odour of the dressings and discharges from the affected thumb and hand of Mr. Y. were most persistent; and, notwithstanding the most diligent use of the nail-brush and disinfectants, the fingers seemed constantly to exhale this offensive smell. Any one who has been accustomed to make frequent post-mortem examinations knows how pertinaciously the peculiar odour of the subject adheres to one's hands, and that it seldom disappears until the day following that on which the post-mortem was made. The reason appears to be that the increased temperature and more active capillary circulation which obtains when one is warmed in bed, cause greater rapidity in the cutaneous transudations and exhalations from the hands. When, however, imbibition by, and impregnation

of, the epidermic cells, from prolonged contact with decomposing animal matter, is repeated twice daily for many weeks, it is not difficult to understand why it is that a continuous exhalation of an offensive character should be given off from these cells, in which, for the time, the septic matter would appear to have been stored and fixed.

The rate of exhalation would, to a considerable extent, depend upon the temperature of the hands and surrounding air; and, thus, in the cold spring weather, it would be given off more slowly. But if brought suddenly into contact with the maternal passages of the parturient woman, and retained even for no great length of time there, where the facilities for rapid absorption are easy and great, the hand of the accoucheur so impregnated might produce an amount of mischief, the end of which it would be difficult to foresee. Especially would this be the case in primiparous cases, where there are almost constantly bruising and some laceration of the passages. Proceeding still further, we know that amongst the gaseous and other products which result from the putrefaction of dead animal tissues, are sulphuretted hydrogen, sulphuret of ammonium, and butyric acid. When solutions of these substances are injected into the cellular tissue of dogs and horses, as has been done by Billroth and Weber, septicæmia resulted—the animals dying in consequence.

If we now apply this to the case of Mrs. A., an explanation may be furnished as to the manner by which the septic matter gained access to the blood and tissues. It has been shown that the mucous membrane of the interior of the uterus contains lymphatics (Stricker's account of them is extremely meagre), which are highly absorbent; and as Dr. Robert Lee has demonstrated, that in cases of septicæmia the veins of the uterus are always clogged up by coagula, it can only be by the former that the septic material, be it particulate or non-particulate, finds its way through the great lymphatic abdominal chain to the peritoneum, and there excites the peritonitis which is so frequent a concomitant of this disease.

[Dr. SIMPSON, commenting on these cases, said that Dr. Hunter had undoubtedly carried a morbific agent, and it was therefore important to watch the kind of source from which such an agent might arise, and it might come from less striking sources than the case to which Dr. Hunter had traced his empoisonment. Thus, in a case of his own, it was traced to the sore thumb of the nurse; and in a second instance it was traced to the nurse, who had been dressing an old ulcer on her leg. Then again, the obstetrician might get the poison from the fœtid lochial discharge of a patient already confined, although it was doing the woman herself no harm, for the simple but very

sufficient reason that ere the discharge had become dangerous the lacerations in her own genital canals had begun to granulate or that there had been no wound surface produced during labour.

Dr. SMART said, as to Dr. Hunter's doubts on the source the poison, he should remember that puerperal women are susceptible, that an infinitesimal dose might do all the mischi Many years ago, in a debate at the Royal Medical Society, had ventured to generalize the whole question into one of ticæmia. As physician and pathologist in one of the larg obstetrical hospitals in Britain, he had ample proof that p peral fever was septicæmia. He indeed considered it danger for an accoucheur or medical man in practice to attend post-mortem. As to the question of puerperal fever exis as an epidemic, if they admitted it was a septic disease, t they got at the question at once. There was no epidemic puerperal fever apart from direct septic influences. All k how easy it was to produce an epidemic, or quasi-epide Medical men should, therefore, be very careful in avoiding places where such dangers could be.]—*Obstetrical Journal, O* 1876, *p.* 471.

ADDENDA.

100.—ON THE EFFECTS OF CUCA, OR COCA, THE LEAVES OF ERYTHROXYLON COCA.

By Sir ROBERT CHRISTISON, Bart., M.D., D.C.L., LL.D., F.R.S.Ed., President of the British Medical Association, &c.

The early historians of Peru have taken special notice of the culture, properties, and uses of cuca. Among these, none is more full, clear, and fair, than the famous chronicler of the reign of the Yncas and of the Spanish conquest, Garcilasso de la Vega. His narrative bears internal evidence of great historical care. Other reasons, to be alluded to presently, also add to the confidence which the statements themselves create in the reader; and hence it is scarcely necessary to refer to any other early authority. Garcilasso's information was derived partly from what he personally knew, partly from a Spanish priest, Blas Valera, who was long in Peru, and whose manuscripts came into the historian's possession.

The plant is described as a shrub about six feet high, much resembling in foliage the strawberry-tree of Spain (*Arbutus Unedo*), but producing much thinner leaves; and it is stated that the gatherers pick off the leaves individually with caution; dry them quickly in the sun, so as to retain their green colour, which is much prized; and preserve them carefully from damp, which seriously damages their quality. Garcilasso adds an anecdote which illustrates both the Spanish dislike and the real virtues of cuca. A Spanish friend of his met one of his countrymen, a poor soldier, plodding his solitary way among the Andes, chewing cuca, and carrying his two-year-old child in his arms. On upbraiding the man for adopting a barbarian custom, abhorred by all true believers as the fruit and symbol of idolatrous worship, the soldier said that might be; he at one time shared in these prejudices, but had found he could not carry his child without the strength which the cuca imparted, and was too poor to afford the cost of a bearer to relieve him of his burden. Nowhere does the author of the Royal Commentaries of the Yncas say one word of any evil consequences actually resulting from the use of this vegetable becoming a habit.

My first trials were made in 1870, when I was not aware that any one else in Europe had experimented with it. My specimen was sent to me by a London mercantile gentleman, Mr.

Batchelor, six years before, and must therefore have been kept for seven years at least. The leaves had been excellently dried, flat, unbroken, and green; and they had been equally well preserved by sprinkling a little quick-lime among them before being shipped. Even in 1870 they were green, brittle, and strongly scented. Two of my students, out of the habit of material exercise for five months, tired themselves thoroughly with a walk of sixteen miles in the month of April. They returned home at their dinner hour, having taken no food since a nine o'clock breakfast. They were very hungry, but refrained from food, and took each an infusion of two drachms of cuca, made with the addition of five grains of carbonate of soda, which was added to imitate the Peruvian method of chewing the leaves along with a very small quantity of lime or plant ashes. I am satisfied, however, that any such addition is superfluous. Presently hunger left them entirely, all sense of fatigue soon vanished, and they proceeded to promenade Prince's Street for an hour; which they did with ease and pleasure. On returning home their hunger revived with great intensity; they made an excellent dinner; they felt alert all the subsequent evening, slept soundly all night, and next morning awoke quite refreshed and active. One of them, in setting out for the evening promenade, felt very slightly giddy, as if he had taken just a little too much wine. But the other experienced no other sensation than the removal of fatigue, and ability for active exertion.

Having subsequently received from Dr. Alexander Bennett a larger supply, obtained by him in Paris, I made farther trials in the spring of last year, 1875. This sample was more broken, less green, less scented than the other, less strong in taste, and scarcely producing any sense of warmth in the mouth when chewed. Obviously it was of lower quality. Ten of our students made trial of it under conditions precisely similiar to those observed in the prior experiment; and they reported the results to me severally in writing. Their walks varied between twenty and thirty miles, and three cleared the latter distance on a rather hilly road at nearly 4½ mile pace over all. Two were unable to remark any distinct effect from the cuca. Several felt decided, but only moderate relief from fatigue. Four experienced complete relief, like their predecessors in 1870; and one of these had walked thirty miles without any food. All found their hunger cease for a time; but shortly afterwards neither appetite nor digestion was at all impaired. No disagreeable effect was produced at the time or subsequently, except that a few felt a brief nausea after their dose, owing probably to the form of infusion in which it was taken.

I then determined to make some careful personal trials with

the scanty remains of my best specimen. For this purpose I thought it best to adopt the Peruvian method of chewing, but I discarded their lime and ashes. For not only was I unable to discover, in the nature, composition, or effects of the leaf, any chemical or physiological reason for such addition; but likewise I found that the Llipta, as the addition is called, which was presented to me with one of my specimens from Peru, has no alkaline or calcareous taste, and therefore cannot effect decomposition of the leaf while it is masticated. The result confirms the view I had thus taken.

I had first to ascertain what amount of exercise was required to cause very thorough and permanent fatigue. At the same time, I made such observations on certain of the functions as seemed desirable and easily practicable. In the beginning of May, under a day temperature of 58 deg., I walked fifteen miles in four stages, with intervals of half-an-hour, at four-mile pace, without food or drink, after breakfast at half-past eight, and ending with a stage of six miles at half-past five in the afternoon. I had great difficulty in maintaining my pace through weariness towards the close, and was as effectually tired out as I remember ever to have been in my life, even after thirty miles at a stretch forty or fifty years before. Perspiration was profuse during every stage, particularly the last of all. I took the urine-solids every two hours, and found a decided increase of the hourly solids during the forenoon's exercise, and a decrease during the evening's rest after dinner. The pulse, naturally 62 at rest, was 110 on my arrival at home; and two hours later it was still 90. I was unfit for mental work in the evening, but slept soundly all night, and awoke next morning somewhat wearied and disinclined for active exercise, although otherwise quite well. Two days afterwards, I repeated this experiment, and obtained precisely the same results, except that the urine-solids were not so abundant during exercise as before, although my food had been precisely the same.

Four days later, with precisely the same dietary, I walked sixteen miles in three stages of four, six, and six miles, with one interval of half-an-hour, and a second of an hour and a half. During the last forty-five minutes of the second rest I chewed thoroughly eighty grains of my best specimen of cuca, reserving forty grains more for use during the last stage. To make assurance double sure, I swallowed the exhausted fibre, which was my only difficulty. On completing the previous ten miles, I was fagged enough to look forward to the remaining six miles with considerable reluctance. I did not observe any sensible effect from the cuca till I got out of doors, and put on my usual pace; when at once I was surpised to find that all sense of weariness had entirely fled, and that I could proceed

not only with ease, but even with elasticity. I got over the six miles in an hour and a half without difficulty, found it easy when done to get up a four-and-a-half-mile pace, and to ascend quickly two steps at a time to my dressing-room, two floors upstairs; in short, had no sense of fatigue or other uneasiness whatsoever. During the last stage, I perspired as profusely as during the two previous walks. On arrival at home, the pulse was 90, and in two hours had fallen to 72; the excitement of the circulation being thus much less, and its subsidence more rapid, than after the same amount of exercise without cuca. The urine-solids hourly were much the same while the exercise lasted as during exercise on the day of fifteen miles walking without cuca, although the breakfast dietary was precisely the same. During the evening's rest, the urine-solids were almost the same as during the preceding period of exercise—a fact which is capable of more interpretations than one. On arriving at home before dinner, I felt neither hunger nor thirst after complete abstinence from food and drink of every kind for nine hours; but on dinner appearing in half an hour, ample justice was done to it. Throughout the evening I was alert, and free from all drowsiness. Two hours of restlessness on going to bed I ascribed to the dose of two drachms being rather large; and after that I slept soundly, and awoke in the morning quite refreshed, and free from all sense of fatigue, and from all other uneasiness. Another effect, not unworthy of notice, was that a tenderness of the eyes, which for some years has rendered continuous reading a somewhat painful effort, was very much mitigated during all the evening.

I reserved what remained of my good specimen of cuca for further trial during my autumn holidays in the country. On September 15th, while residing at St. Fillans on Loch Earn, I ascended Ben Vorlich. The mountain is 3,224 feet above the sea, and 2,900 feet above the highway on the loch-side. The ascent is for the most part easy, over first a rugged footpath, and then through short heather and short deep grass; but the final dome of 700 feet is very steep, and half of it among blocks and slabs of mica-slate, the abode of a few ptarmigan, of which a small covey was sprung in crossing the stony part. On the whole, no Highland mountain of the same height is more easily ascended. The temperature at the side of the lake was 62 deg.; on the summit, 52 deg. In consequence of misdirection, I had to descend an intervening slope on the way, so that the whole ascent was 3000 feet perpendicular. I took two hours and a half to reach the summit, and was so fatigued near the close, that it required considerable determination to persevere during the last 300 feet. I was richly rewarded, however, by an extremely

clear atmosphere, and a magnificent mountainous panorama, of which the grandest object was Ben Nevis, forty miles off, shown quite apart from other mountains, and presenting the whole of its great precipice edgeways to the eye. My companions, who, as well as I, were provided with an excellent luncheon, soon disposed of it satisfactorily; but I contented myself with chewing two-thirds of one drachm of cuca-leaves. We spent three-quarters of an hour at the top, during which I looked forward to the descent with no little distrust. On rising to commence it, however, although I had not previously experienced any sensible change, I at once felt that all fatigue was gone, and I went down the long descent with an ease like that which I used to enjoy in my mountainous rambles in my youth. At the bottom, I was neither weary, nor hungry, nor thirsty, and felt as if I could easily walk home four miles; but that was unnecessary. On arriving home at five o'clock, I still felt no fatigue, hunger, or thirst. At six, however, I made a very good dinner. During the subsequent evening, I was disposed to be busy, and not drowsy; and sound sleep during the night left me in the morning refreshed and ready for another day's exercise. I had taken neither food nor drink of any kind after breakfasting at half-past eight in the morning; but I continued to chew my cuca till I finished the sixty grains when halfway down the mountain. I had not with me in the country any apparatus for observations on the renal secretion.

Eight days afterwards, I repeated the experiment, but used ninety grains of cuca. Being better acquainted with the way, no ground was lost by any intervening descent, so that the perpendicular height to be reached from the highway was 2,900 feet. I took two hours and a quarter to ascend, and on reaching the summit was extremely fatigued. The weather had changed, so that the temperature, 51 deg. at the loch-side, was 41 deg. at the top. A moderate breeze consequently caused so much chilliness that my party were glad to redescend in half an hour, by which time I had consumed two-thirds of the cuca, taking, as formerly, neither food nor drink. The effects were precisely the same, perhaps even more complete, for I easily made the descent without a halt in an hour and a quarter, covering at least four miles of rugged ground; and I walked homewards two miles of a smooth level road to meet my carriage. I then felt tired, because nearly three hours had elapsed since I consumed the cuca, and in that time the Peruvians find it necessary to renew their restorative. But there was no more cuca left, and I was tempted to substitute a draught of excellent porter. I suppose this indulgence led on to the unusual allowance of four glasses of wine during dinner, instead of one or none; and the two errors together, with

possibly some discordance between cuca and alcohol, were the probable cause of a restless feverish slumber during the early part of the night; but quiet sleep succeeded, and I awoke quite refreshed and active next morning.

One of my sons, who accompanied me on both occasions, used cuca the first time, but also took luncheon on the summit. Though not in good condition for such work, he made it out without fatigue; and on the second occasion, when there was no more cuca to give him, he felt decidedly the want of it when he reached the highway at the foot of the mountain.

These trials have been described particularly, because I feel that, without details, the general results, which may be now summarised, would scarcely carry conviction with them. Them are the following. The chewing of cuca removes extreme fatigue, and prevents it. Hunger and thirst are suspended; but eventually appetite and digestion are unaffected. No injury whatever is sustained at the time, or subsequently in occasional trials; but I can say nothing of what may or may not happen if it be used habitually. From sixty to ninety grains are sufficient for one trial; but some persons either require more, or are constitutionally proof against its restorative action. It has no effect on the mental faculties, so far as my own trials and other observations go, except liberating them from the dulness and drowsiness which follow great bodily fatigue. I do not yet know its effects on mental fatigue purely. As to the several functions, it reduces the effect of severe protracted exercise in accelerating the pulse. It increases the saliva, which, however, may be no more than the effect of mastication. It does not diminish the perspiration, so far as I can judge. It probably lessens the hourly secretion of urine-solids. On this point I cannot yet speak with any confidence, because it appears to me that the investigation of the action of *paratriptics*, or those substances which seem to lessen the wear and tear of the textures of the body in the exercise of their several functions, involves considerations and precautions which have escaped the attention of experimentalists on this interesting question, and which my own experiments hitherto have not taken completely into account.

I have made no trials of the influence of cuca on disease, or the consequences of disease. Some notices in the journals on this subject show that it is attracting attention; but, so far as I see, it is a difficult one, and may prove extensive, and therefore it ought to fall into the hands of some able inquirer, who will be in no hurry to rush into print. I have been asked by correspondents in the south of England if cuca will do good to a weak heart, to an old paralysis, to the feebleness of advancing age, &c. My reply has been, that I know nothing of all

this, and that no one should use it medicinally, but under the advice and observation of his medical attendant.

A more convenient form for use than that of a quid is very desirable. M. Laumaille, who rode, or on very bad roads led, his bicycle 760 miles from Paris to Vienna in little more than twelve days, in the month of October, carried with him, as part of his scanty baggage, "a small supply of the liqueur de coca, an Indian tonic, by which he was always able to assuage the sudden and painful hunger which sometimes accompanies continued exertion." Unfortunately, he gives us too little of his experience with it; but he observes that, when about sixty miles from Vienna, "continuing his way along a road of fluid mire, fatigue and sleep at length told upon him, but the marvellous liqueur de coca again supported him and gave him strength." I have made by rule of thumb a very palatable liqueur, with only a fourth of rectified spirit, and containing in half-an-ounce the soluble part of sixty grains of leaves, but I have not yet tested its virtue. Pharmaceutical chemists, however, will soon solve this problem, and, it may be hoped, without looking for a patent.—*British Medical Journal, April* 29, 1876, *p.* 527.

101.—A NEW USE FOR COCA.

By Dr. A. L., Devon.

[Dr. A. L. is very fond of sport, but unfortunately cannot hit anything owing to violent thumping of the heart occurring just at the very time he is taking aim. The idea occurred to him that this might be controlled medicinally.]

Filling my flask with the coca tincture, instead of with brandy, I made the first experiment by swallowing, when commencing to walk, half an ounce of the tincture, with no apparent result. On the following day this quantity was doubled, taken in two doses at a short interval, with a certain amount of effect. It was not, however, until the third day, when the quantity of the previous day was doubled, making two ounces of the tincture, boldly taken at once, that the full influence of the coca was obtained.

I should premise that the distances daily travelled have hardly been sufficient to test the power of coca in preventing fatigue. I am bound to say, however, that I was not conscious of its having exercised any such power. The effect produced was, in fact, in a direction altogether new and unexpected.

As soon as the dogs pointed, I expected the usual inward commotion with its usual results; but, to my surprise, nothing of the kind happened, and down went the birds right and left. "Eureka," I said to myself; the coca has made me a steady

shot. So, in fact, it subsequently proved, to the wonder and pleasure of my host, who is more gratified at seeing his friends enjoy good sport than in having the sport himself.

My stock of the tincture was insufficient for extensive trials; but I tried chewing the leaves, also with effect. From what I know of the strength of the tincture I am inclined to think that the drug is more active when simply chewed. Unfortunately, however, my power of chewing the leaves is limited by a nauseating effect of the process.

Judged by the effects described, coca would seem to be inhibitory as regards the action of the heart. Whether this result is produced by indirect action through the mental functions upon which the drug is said to act remains to be proved. The hints afforded in the meantime may prove of great value. Coca in sufficient doses would seem to be a powerful nervine tonic; and as its effects appear to be entirely harmless, if my observations are confirmed by others, its use will be hailed as a boon by many a brother sportsman.

[A lay correspondent, who was lately out in Bolivia for two years, also writes to us on the subject of coca. Whilst travelling at great altitudes, such as from 13,000 to 14,000 feet above the sea level, he experienced marked benefit from eating the leaves. Nearly all travellers on the Peruvian and Bolivian Andes use the drug as a remedy for that effect on the brain and lungs produced by rarefied air, which in South America is called "zorroche." One use to which it is put by the Indians is that of a "pick-me-up" after a debauch on alcoholic fluids. In Bolivia it is generally eaten with a paste made of wood-ashes and potato. Our correspondent propounds the belief that the leaf loses its virtue in transmission. This is quite possible. It is an undoubted fact that the cannabis indica, for instance, loses its potency in crossing the sea. It would seem desirable that a certain quantity of the coca-leaves should if possible be packed in an air-tight case. The price of coca at La Paz, where the best is procured, was last year 16 dollars per packet of 25 lb.—ED. LANCET.]—*Lancet, Sept.* 23, 1876, *p.* 449.

102.—THE COLD BATH TREATMENT OF ENTERIC FEVER.

By Dr. JOHN MCCOMBIE, Assistant-Medical Officer, Metropolitan Asylum District Fever Hospital, Homerton.

To James Currie unquestionably belongs the merit of having first, with any pretence to scientific precision and accuracy, systematically employed cold water in the treatment of the continued fevers.

In the year 1872 this treatment was tried at the Homerton Fever Asylum, the results of which were published in the Lancet

of that year. The results of that experience and of subsequent trials during the following three years have been such as to lead to the adoption of the cold bath in that institution as one of the recognised and most valuable means at our disposal in the treatment of certain cases of enteric fever. As this treatment is far from having attained that place in the therapeutics of this disease which our experience has led us to believe it deserves, we have thought that an account of the method of its employment, and the results, would not be unacceptable to the profession.

The method employed by us in the administration of the cold bath is as follows:—An ordinary plunge bath is filled with water of the desired temperature. The patient, previously enveloped in a dressing-gown, is wheeled from the ward into the bath-room, bed and all, on a bed carriage, placed alongside the bath, and lifted into it by two attendants. The whole of the body is kept constantly under water, with the exception of the face, which is sponged with water of the temperature of the bath, and the mouth is thoroughly cleansed of all sordes and filth which collect on the gums, tongue, and teeth. If it is desired to lower the temperature of the water while the patient is in the bath, we effect this easily and noiselessly by having an india-rubber hose attached to the cold water tap, at such a length as to reach well under the water in the bath, so as not to alarm the patient by the sound of water running from a height, as well as to facilitate the equable distribution of cold water through the bath. In summer, during very hot weather, we sometimes find it necessary to add ice. We do not retain a patient, as a rule, longer than fifteen minutes in a bath of temperature 75° reduced to 65°, or ten minutes in a bath of 65°. We generally employ baths of the latter temperature, as they are borne well by patients, although in some cases, children especially, we find it advisable to employ baths of temperature of 80° reduced to 70°. It is necessary, in most cases, to administer stimulants to the patients while in the bath, owing to the tendency the cold has to cause failure of the heart's action. The amount of stimulant required can only be determined by the weakness of the pulse and state of the patient. When the patient is taken out of the bath he is wrapped in a blanket, put to bed, and allowed to remain undisturbed, except for the administration of nourishment, for some hours. If signs of collapse come on suddenly during the bath, the patient is immediately withdrawn, and means employed for restoring the circulation.

The indications for the use of the cold bath in enteric fever are high temperature, associated with rapid pulse, want of sleep, great restlessness and delirium. Bronchitis and pneumonia form no contra-indication. It is the general practice in

Germany to regard temperature alone as the chief indication for its employment, and whenever a certain temperature is reached (103° Fh. in rectum) the bath is administered and repeated as soon as the reduced temperature attains its former height. This we think unnecessary, and a serious inconvenience to the patient, inasmuch as many persons tolerate a temperature of 103° and upwards with comparative equanimity, and without any apparent danger to life, whilst others suffer from constant sleeplessness, great restlessness, and delirium, with a lower temperature. It has, therefore, been the practice at Homerton, whilst regarding the indications afforded by the temperature as of great value, not to consider it the only or the chief indication; that when a patient with the above temperature sleeps fairly, has slight delirium and no marked restlessness, the bath is not administered, but when these symptoms are well marked and persistent, and accompany that temperature, or if they are present with a lower temperature a bath is considered advisable. Indeed we may say that we have found the best results from the administration of a bath in a temperature slightly over 100° when accompanied by the symptoms we have mentioned.

In reference to the temperature, however, it is of the utmost importance in this treatment that in all cases it should be taken at least every two hours night and day, and in some cases it is even desirable that this should be done every hour. The practice of making morning and evening observations only would be sufficient if the maximum and minimum temperatures were always attained at fixed hours; but inasmuch as the periods of the day at which these temperatures occur, as well as their duration, vary indefinitely, it is necessary for the purpose of accuracy that these should be ascertained as often as we have stated, for it may be stated generally that the maximum temperature may occur any time between 10 a.m. and midnight, and the minimum temperature any time between midnight and 10 a.m., and in many cases two or even three maxima are found, and a corresponding number of minima. It will be clear then if this be correct that by limiting our observations to certain morning and evening hours the maximum temperature may never be observed at all.

Whilst giving due weight to the temperature and the other symptoms which we have mentioned, the state of the pulse is of the utmost importance, and of itself alone is an important indication for the administration or rejection of this remedy. When this is very rapid, fairly full and strong, accompanied by much flushing of the face and headache, the bath may be employed unhesitatingly and with great advantage; but if the pulse is very weak, above all if it be intermittent, and there be

evidence of great weakness of the heart's action, if it be used at all it ought to be used with the very greatest caution, always with the constant administration of stimulants, not very cold, and the hand of the physician ought to be kept constantly on the patient's wrist, so that in the event of signs of syncope supervening, the patient may be immediately removed.

No hard and fast rule, therefore, exists for the use of the bath, and it is only by carefully noting the temperature from day to day and from hour to hour, together with the character of the pulse, the amount of sleep the patient has had, the severity of the delirium and the restlessness, that the physician is able accurately to judge when a bath is indicated. No single symptom, unless present in a very marked degree, renders imperative the use of this remedy, but when all combine to produce serious disturbance of the nervous, circulatory, and respiratory systems, then in the absence of contra-indicating symptoms, the cold bath may be employed without danger, and with the most beneficial results.

With regard to the contraindications, one of the most important is hemorrhage from the bowels. Irrespective of the fact that hemorrhage, if in large quantity, of itself causes a reduction of the temperature, it is to be borne in mind that its occurrence may be favoured, and, if it has occurred, its amount increased, owing to the quantity of blood circulating in the interior of the body being augmented by the continued application of cold to its surface. Menstruation will, for the same reasons, form a not unimportant contraindication.

In speaking of the pulse, we have already stated the symptoms referable to the heart which necessitate the employment of this agent with caution, a caution which must become an absolute negation if the heart's action be extremely feeble and irregular, the first sound almost inaudible, and the patient present evident signs of deficient circulation; for should we administer the bath to a patient whose pulse already presents these characters, we should be in very great danger of causing absolute failure of the heart's action, inasmuch as our experience has taught us that the effect of the cold bath is to make the pulse almost invariably feebler, in many cases irregular, and in some imperceptible. On symptoms of peritonitis or pleurisy setting in we must immediately desist from its employment. In cases of advanced pregnancy it is contraindicated, from the liability to the occurrence of abortion being increased by the action of the cold tending to produce contraction of the muscular fibres of the uterus. But if the patient be only two or three months advanced in pregnancy, inasmuch as abortion will probably take place in any case, we do not hesitate to employ the bath, should symptoms demand it. Any tendency to

convulsions, hereditary or acquired, also militates against its employment. Should, as we have sometimes observed, the patient exhibit a high degree of nervous excitement on being immersed in the bath, and if on its employment a second time this excitement be undiminished, we consider it unadvisable to persist in its use, for the injurious effect of terror and excitement would in a great measure counteract any beneficial effect which the bath might have. Most patients enjoy it, some even ask for it; rarely is it disliked, except by children.

Its immediate effect is to reduce temperature and diminish nervous excitement. The rapidity and extent of the fall of the temperature varies according to the temperature and duration of the bath, the temperature and amount of adipose tissue of the patient, the hour of the day, and the severity of the disease. With a bath of 70° Fh., of ten minutes' duration, the temperature of the patient being over 103° Fh., a fall of four or five degrees generally takes place. From an extended series of observations we have ascertained that it continues to fall for one-half to three-quarters of an hour after the bath, then begins to rise, and regains its previous height, in some cases in from two to three hours; in others after a longer time, and in mild cases perhaps not at all during the remainder of the disease. As we should expect, the effect of a bath given about or after midnight is of longer duration than if given about or after midday.

In the bath the pulse becomes weak and wiry, in many cases, more especially children, almost or even wholly imperceptible, In most cases it is reduced in frequency, but seldom to the extent of more than fifteen beats per minute. Observers in Germany state that it becomes stronger and reduced almost to its natural number of beats. In our experience we have never seen a case in which this took place.

Important as is the effect of the bath on the temperature, of equal if not greater importance is its effect on the symptoms referable to disturbance of the nervous system. In all cases it diminishes restlessness and delirium; in the great majority it produces sleep, and that too after the patient has passed many delirious and sleepless days and nights, and even should it fail to induce sleep, almost without exception, after its administration, the patient dozes quietly for some hours. Sleep, as a rule, follows within an hour, and continues, in some cases, two or three hours, in some three or four, and in others even five hours or longer. After ninety-eight baths administered in cases of enteric fever, in which the effect was carefully noted, in seventy-one cases sleep followed, in twenty-one cases the patients dozed for some hours, and in two only did it fail to effect even the latter. Of the benefit which a patient who has

contracted a severe attack of this disease derives from a few hours natural sleep it would be difficult to form an exact estimate, but it may be stated without fear of contradiction that few if any other symptoms are more to be feared than continued sleeplessness and delirium, and were the value of the cold bath as a remedial agent to be determined alone by its sedative action on the nervous system, we are convinced that this would be sufficient of itself to secure it a high place amongst the therapeutic agents at our disposal. Sleep is at all times important, and, if uninterrupted for any length of time, indispensable for the maintenance of life, but in no case is it more imperatively called for than in that of a patient suffering from this disease, who may have passed many sleepless and delirious nights; and certainly never have we seen a more marked effect follow the administration of any sedative than that which follows, in the majority of instances, the administration of a cold bath to such a patient. A sleep quiet and natural supervenes, and the patient wakes up after the lapse of some hours greatly refreshed, and with a diminution of at least many of the more serious symptoms.—*Practitioner, Nov.* 1876, *p.* 343.

103.—ON HEART DISEASE IN CHILDREN.

By Sir WILLIAM JENNER, Bart., M.D., &c.

In an attack of rheumatism, the disposition to inflammation of the heart and its membranes is in direct proportion to the youth of the patient; the younger the heart, the more readily it is affected; and this is a form of malady likely to increase with years. Parents often hope "the child will grow out of it:" the heart of course, must grow; but, if the valves be imperfect, they must become more patent as the size increases; whereas, in older patients, the heart having ceased to grow, the mischief at least remains stationary. The fact is, then, that, as regards valvular diseases, children rather *grow into* their trouble than out of it. The pathology of heart-disease is also largely a question of age; for instance, if I were to be affected, it would probably be of degenerative character; but, if a child, or even one of you, it would almost always be rheumatic. You must, however, bear in mind its possible connection with albuminuria, with syphilis, or with congenital defect. Independently of these, it will almost surely be the result of rheumatism, though the attack may have been so slight as to have been forgotten. If you find evidence of cardiac disease, and if you do not get a history of ordinary causes, you must have very unequivocal evidence to prove they did not exist. The more improbable any point is, naturally the stronger must be the evidence of it. If Dr. Slade tell me he gets spirit-writing, his proofs ought to be

above suspicion. If endocarditis in a child be the *only* symptom present, still it must be taken as strong evidence of rheumatism. I remember a boy who came with no definite complaint; but we found a loud friction-sound over the heart; a week afterwards, he got swelling of the joints and other evidence of rheumatism. Another case was more striking, and occurred in the young child of a medical friend. It was found late at night suddenly suffering from great dyspnœa: I was sent for hurriedly in the absence of the father, and found a loud mitral *bruit*, which had never been suspected before. Half an hour afterwards the father returned, to find dead the child that he had left apparently well. It was two years old, and, after much consideration, they remembered that, about twelve months before, its limbs had seemed very tender, and it was uneasy in walking; but these symptoms had passed away and been forgotten; no doubt, they indicated the commencement of the attack. The least sign, then, of such trouble in children should be most carefully watched; and remember the great tendency of the malady to recur, so that after one attack, care should be constant. *Chorea* has been considered a rheumatic inflammation of the spinal meninges. The rheumatism may be a coincidence, but it is certainly a common one. If there be active endocarditis at the time, I consider it certainly rheumatic; but, in estimating the importance of a *bruit*, inquire whether it varies, is absent from certain beats, or whether it be constant; for, if the former, it will often be dynamic from irregular action of the papillary muscles. I remember a child with chorea and a *bruit* of organic character, but no other evident rheumatism. In a week, however, he got urticaria, and later a marked attack of acute rheumatism. Another baby with chorea was intensely fretful, and I found the explanation in signs of acute pericarditis, which, indeed, proved fatal soon afterwards.

Ascites is never directly produced by heart-disease, but only after organic disease of liver has occurred.—*British Medical Journal, October* 28, 1876, *p.* 354.

104.—ON THE ACTION OF HYOSCYAMINE AND ITS RESEMBLANCE TO ATROPINE.

By J. Sydney Pearse, Esq., Physician's Assistant, University College Hospital.

These investigations have been made with the crystalline hyoscyamine, imported from Germany and prepared for use by Mr. Martindale, of New Cavendish-street. The strength of the solution was one grain in two drachms, similar to the liq. atropiæ of the Pharmacopœia.

Its external application to the skin appears to have a similar

action to atropia in relieving pain. I have seen this in two instances. In one an hysterical woman had complained of neuralgic pains in the temporal region for two days without any apparent cause. A few drops of the solution were painted over the painful spot, and in half an hour the pain had almost entirely disappeared. It produced no redness of the skin, and, as far as could be judged, no anæsthesia. The skin was dry before the application, so that the action of the secreting glands could not be said to be checked. The other instance was on a patient suffering from pleurodynia, in which the pain was removed, but not to the extent of the other case. The application, however, was not repeated more than once.

The solution, when painted into the skin in the neighbourhood of the eye, does not appear to produce any topical action on the pupil, there being no dilatation, and no alteration of vision. If this be true, it will differ from atropia in this respect. When dropped on the conjunctiva its action is evidently very similar to atropia. The dilatation is, perhaps, not quite so rapid as when caused by atropine, but the amount of contraction of iris is quite as great, and the effects last equally long, if not longer. The amount used in each observation was about $\frac{1}{240}$ grain, and probably some of this escaped. Its application does not cause any uneasiness, and it was on one occasion noticed to relieve pain in the eye immediately on introduction, and before the pupil commenced to dilate. As soon as the topical action commenced misty vision was frequently complained of, which lasted from a few hours to four days. This was present in about half the cases, and varied from a slight dimness to an extent which rendered it impossible for the patient to read unless the print was within two or three inches of the nose.

The time required to produce full dilatation was found to be about fifteen minutes; the longest being twenty-five minutes, and the shortest ten minutes. In no instance did it fail to produce its results; and in the majority of the cases the dilatation was extreme, the iris being reduced simply to a narrow line. No diplopia was produced. There was total insensibility of the iris, lasting a variable time; the duration of dilatation also varied, lasting from two to twenty-one days. The following table shows the average:—

No.	Time for full dilatation.	Duration of Dilatation.	Pupils react fairly well.	Affection of sight.
1	13 min.	5 days	4 days	Dim vision, lasting till 4th day.
2	15 min.	6 days	4 days	Vision good throughout.

3 ..	17 min. ..	10 days ..	2 days ..	Slight dimness of vision.
4 ..	15 min. ..	12 days ..	36 hours ..	No alteration of vision.

In no instance was sufficient applied to produce dilatation of the opposite pupil, or other constitutional effects.

When used hypodermically, the results produced by hyoscyamine are very similar to those of atropine. The dose, however, must be somewhat larger to produce the same effect as atropia. Dr. Ringer finds that "in profuse sweating, produced by the hot chamber of the Turkish bath, $\frac{1}{100}$ gr. or $\frac{1}{150}$ gr. of atropia will in a few seconds completely dry the skin and kept it dry, and that the same dose would arrest the sweating of phthisis." One minim of the solution, containing $\frac{1}{150}$ gr. of hyoscyamine, was injected hypodermically in a man suffering from phthisis, perspiring profusely. No effects were produced except a little dryness of the mouth, and of this there could be no absolute certainty. If, however, the dose be doubled, and one-sixtieth of a grain be given, the symptoms produced are constant and well marked. Like those caused by atropia, they are—dryness of the skin, mouth, and pharynx; great thirst; flushing of the face; injection of conjunctiva, dilatation of the pupil, and loss of power of accommodation of the eye; pulse increased in frequency, the fulness being also increased. There is also headache, giddiness passing on to a semi-conscious condition and sleep.

The dryness of the mouth and pharynx were invariably present, coming on usually within half an hour of the injection. The skin in some instances became hot as well as dry, and a rise in the temperature to the extent of 1° in an hour was noted where the full constitutional effects were produced. The mouth became dry, thirst being great, but in no instance was this stage succeeded by difficulty in swallowing and hoarseness, nor was the dryness replaced by a viscid, sticky, foul-smelling secretion, as found by Dr. Harley with atropia. The flushing of the face and injection of conjunctiva were well marked, the pulsation of the carotids being increased and visible on the surface in a few observations; but the pulsation of the carotids and injection of the conjunctiva were frequently absent, although the face was almost always flushed. Dilatation of pupil was very obvious, and usually present. Generally speaking, the dilatation was not so great as that due to local application, nor were the effects so permanent, the iris having recovered itself within twelve hours. The power of reacting to light was also lost, there being misty vision and loss of accommodation, usually followed by sleep. The pulse was increased

in frequency, the increase, however, not being so great as is caused by atropia; the greatest rise noticed with hyoscyamine was 36 pulsations per minute, whereas with atropia 50 or 60 beats per minute above normal have been recorded. The average of ten observations with hyoscyamine (one-sixtieth of a grain each) gave an increase of 18, but it was found by increasing the dose that there was a corresponding increase of pulse: for instance, $\frac{1}{120}$ gr. caused an increase of only 8 beats, $\frac{1}{80}$ gr. an increase of about 18, and $\frac{1}{40}$ gr. an increase of 36. The increase commenced within five minutes of the injection, and had reached its point of maximum intensity in about half an hour. This increase generally lasted less than an hour, and the frequency of pulse had fallen to its normal condition in three or four hours. It was not noticed to have fallen below the normal average, although it lost in strength as the heart's action became slower. No irregularity of the heart was observed.

The headache, giddiness, and tendency to sleep were induced in the majority of instances, but where the headache was very severe this prevented sleep. The mind was not affected, and there was no delirium.

Atropia is said to produce unsteadiness of gait. This was not noticed except in a patient with locomotor ataxy, in whom the ataxic condition was greatly intensified when under the influence of this drug. He suffered acute shooting pains in the affected limbs, which were at all times considerably relieved by the hyoscyamine. It never caused inflammation at the place of administration.

Effects on the urine.—In comparing the action of hyoscyamine with that of atropia, the results do not appear to be similar; for it has been pointed out that atropia increases the quantity of urinary water, whereas hyoscyamine, as far as these observations show, does not affect the secreting power of the kidneys, or, if it has any action, tends to lessen the urine. In estimating the amount of urine secreted, the patients emptied their bladders every hour for at least four hours prior to the administration of the drug, the whole amount was measured, and the average taken. In No. 1 the hourly average before was ten drachms, afterwards it was reduced to six drachms. In No. 3 the average before was ten drachms, which, after the drug, was raised to sixteen drachms. This is the only time an increase was noticed, and on repeating the observation two days afterwards on the same patient, it was found that the average after the hypodermic administration was less by two drachms than it was before. From further observations, the same conclusion was arrived at—viz., that the secretion of urine is not increased by hyoscyamine.—*Lancet, Sept.* 2, 1876, *p.* 319.

105.—BROMOHYDRIC ACID.

By Dr. J. MILNER FOTHERGILL, Assistant-Physician to the West London Hospital, &c.

The utility of the bromide of potassium is now generally acknowledged by the profession, and its effects upon the nervous system are often of the greatest service. At the same time it is not readily combined with several agents with which it may be advantageously administered, as quinine, for instance. Last year, I abstracted for the London Medical Record (April 20th, 1875), a paper by Dr. De Witt C. Wade on this agent, which appeared in the Peninsular Journal of Medicine in February 1875. He described there the usefulness of bromohydric acid, especially in obviating the headache which is produced in some persons by quinine. From what he said, I handed over his paper to the dispenser of the West London Hospital, and commenced to prescribe the new remedial agent. The formula is as follows, for the production of the acid in quantities of two quarts. Dissolve ℥x, ʒiv., gr. xxviii of bromide of potassium in four pints of water, then add ℥xiii, ʒi, gr. xxxvii of tartaric acid. The bitartrate of potash is precipitated, and the hydrobromic acid remains in a clear bright, almost colourless, fluid, possessing an acid taste and the ordinary acid properties, as well as the peculiar properties of bromide of potassium, as compared with any other salt of potash.

The accuracy of this last statement may be challenged by some readers. I will, therefore, briefly relate the conclusions arrived at after a twelvemonth's experience of the drug. It certainly does prevent the occurrence of headache, after each dose of quinine, in those who before had to desist from taking quinine for that reason. It is, perhaps, not invariably successful, but its power is very marked. It also prevents the fulness felt in the head by some persons, especially those labouring under cerebral anæmia, after doses of iron. It is also useful in nervous conditions, and, with quinine, is excellent in those cases where there is much nervous exhaustion from excessive indulgence in tea or in alcohol; this being tried in a case of nervous excitability and sleeplessness, where there had been much resort to chloral-hydrate.

In forms of excited action of the heart, connected with general nervous excitability or nervous exhaustion, hydrobromic acid is most useful. Given with quinine (of which it is a capital solvent) and digitalis, it gives better results than the bromide of potassium and digitalis; this is a favourite combination with me at both my hospitals, and is agreeable as well as effective. In all hysterical conditions connected with ovarian excitement, it seems to have all the properties of the bromide of potassium.

It is equally useful in the vomiting of pregnancy, and seems to exercise quite as powerful an influence over acts of reflex origin as does the bromide. It is especially adapted for the relief of menorrhagia associated with sexual excitement, and is even more effective here than the bromides themselves. It is also of use in whooping-cough, and combines conveniently with quinine, forming an effective measure in this troublesome affection. With spirit of chloroform and syrup of squills, it forms a most agreeable and palatable cough mixture of no mean potency. It is also of use in case of cough of reflex origin. Where there is gastric irritability, it is the most useful of all acids, possessing the usual properties of acids generally and of the bromine as well.

The dose of the acid, prepared as above, is one drachm as a full dose. Half a drachm is the dose I ordinarily employ. Bromohydric acid has the further advantage of not producing the troublesome eruption so often the result of doses of the bromide of potassium, at least so far as my experience has yet extended. There are many qualities about this acid to render it an useful member in our therapeutical *armamentarium*.

Dr. Wade states that it is useful in the treatment of fever. It would seem the acid *par excellence* where there is much cerebral excitement in pyretic affections, but of this I have no personal experience.—*British Medical Journal, July* 8, 1876, *p.* 42.

106.—FERRUGINOUS PREPARATIONS IN SPECIFIC AFFECTIONS.

By JOHN C. LUCAS, Esq., Surgeon H.M.'s Indian Army.

All the preparations of iron, and more especially the perchloride and the pernitrate, will prove of considerable avail as a therapeutic, antiseptic, and preventive agent in all specific and zymotic maladies—viz., enteric fever, cholera, septicæmia, erysipelas, adynamic, puerperal fever, &c. We know that the hæmatinic virtue of this drug is largely needed in the cure, as well as in the prevention, of all these affections. In Asiatic cholera it is especially indicated when we come to consider the changes which the blood undergoes, and the morbid state of the vascular system, from the heart down to the minutest capillaries; the latter, particularly of the intestines and stomach, according to some modern pathologists, are said to be thrown into spasm, thus encouraging the liquid transudation, and for which antispasmodics are recommended. In cholera and typhoid, by its astringent and styptic action on the coats of the bloodvessels, it ought to prevent the transudation of liquids from the blood. By this means, in cholera it would tend to check the purging and vomiting unless the theory of salutary action be believed and acted upon, in which case this effect would be undesirable.

In the latter stages of typhoid fever it would arrest and prevent the diarrhœa, and likewise exert its topical action on the ulcerative process, prevent hemorrhage, and favour the granulations of the intestinal ulcer.

In puerperal fever I can state from experience the beneficial effect of the drug in this disease, noticing the state of the blood in the gravid condition, the loss of the vital fluid during the process of parturition, and perhaps prior and subsequent to it as well, which is not an unfrequent predisposing cause of this sequel. I need hardly state that the hæmatinic and astringent actions of the drug are manifest. Its usefulness in erysipelas and septicæmia or pyæmia is well known to hospital surgeons.

The evacuations (intestinal) of patients taking iron are deodorised and blackened by the action of the acids of the fæces on the drug; in cholera, where the alimentary discharges are impregnated with the specific virus, by effecting chemical antibacteric changes in the dejecta passed by cholera patients, it deprives the low organisms of their vitality and specific virulence. And if this be the case the discharges, both of the stomach and intestines, would be rendered inert before they were voided. Professor Pettenkofer, of Munich, disinfects the dejecta of cholera and typhoid patients with the sulphate of iron, but after they are passed; how much better, as a sanitary measure, it would be if we could accomplish the disinfection before the dejections are voided.

With regard to the antiseptic action, the same remarks may be applied to typhoid fever.

Concerning erysipelas, septicæmia, and puerperal septicæmia, or fever, it may be said that, as affections the result of blood poisoning, the remedy will, through the circulatory system, have its topical effect, and consequently, by whatever modes the affections are propagated, it would diminish the risk of contagion or infection.

Mode of administration.—It ought to be commenced with from the outset in large and repeated doses, from a drachm to two, of the tincture or liquor of the perchloride, or the liquor of the pernitrate, freely diluted in about three or four ounces of iced water. The remedy may as well be administered per rectum, especially in cholera and typhoid. In addition to being administered in cases of actual cholera and typhoid, I think it would prove of no inconsiderable avail if we could enforce its use in cases of premonitory diarrhœa of the former, or even give it, but in small quantities, to apparently healthy individuals when the diseases are prevailing in epidemic form, or when there is reason to expect an outburst of either. This latter is specially applicable with regard to our troops, who have sanitary as well as medical supervision. Each man in a

regiment may be allowed the required quantity of iron to mix with his drinking-water, or what is still better or more certain, this may be done for him, so that what water he drinks will be sure to contain iron. The taste may, no doubt, be objected to; but by explaining to the men what it is intended for, this little objection would be overcome without much difficulty; and even taking it for granted the iron did not answer these purposes, to say the least, it would have its tonic action, and thus strengthen the system against the diseases. It would, as well, free the water of its animal and vegetable impurities.

When erysipelas or septicæmia is raging in a hospital, the patients affected, as well as those not affected, but exposed to the poison, may be similarly treated.

In the same manner, when puerperal fever is prevailing in a lying-in-institution, &c., the patients affected, as well as all recently confined cases, might be similarly dealt with. It would not be unadvisable to administer the drug in the latter months of utero-gestation.—*Lancet, Oct.* 14, 1876, *p.* 532.

107.—ON THE MODERN NEGLECT OF CALOMEL IN CERTAIN DISORDERS.

By Dr. DYCE DUCKWORTH, Assistant-Physician to St. Bartholomew's Hospital, &c.

What I now desire to call attention to is the neglect of mercurial medication in many so-called "functional" derangements of the body. And, as being uppermost in my thoughts, I mention first, as an instance which calls for this treatment, cases of acute gastric catarrh, the condition described by French writers as *embarras gastrique*, and but too well-known in all ranks of English life as "biliousness." As an accompaniment of many constitutional ailments, of acute inflammations, the continued fevers, the exanthemata and rheumatic fever, it is commonly enough met with, while as a result of intemperance in food and strong liquors it is even more familiarly known. But the frequency of its occurrence in children, not always as a result of over-eating, but often ensuing, I believe, upon check to the functions of the skin from improper exposure and insufficient clothing, is not fully appreciated. In these cases there is sometimes a remarkable degree of pyrexia present at some periods of the day, and several *pseudo-prodromata* of enteric fever may be noted. Indeed this catarrhal fever really constitutes a large part of the early trouble in many cases of the latter disorder. The same condition is likewise very common during active periods of dentition, when the catarrh is often more distinctly appreciable as a

flux from the nasal or bronchial membranes, and may be, and often is, mistaken for the ordinary effects of cold.

In this catarrhal condition, it was formerly, much more than now, the practice to employ either emetics or a mercurial purge. The former have almost entirely gone out of fashion, and I imagine it will be difficult to reintroduce this plan of treatment, despite Dr. Brunton's recent plea for it in this journal: but the use of mercurial preparations is free from objection as far as treatment *jucunde* is concerned. Strong prejudice is met with sometimes amongst classes of patients who can descry the word "*hydrargyrum*" in their prescriptions, and its presence is held to savour somewhat of violent and effete practice, and of unwarrantable undermining of the constitution.

It is in response to some such feeling and objections as these that many practitioners hailed with satisfaction the advent of such a drug as podophyllin, which gained for itself, somewhat unwarrantably, as I believe, the name of "vegetable mercury." This drug, which is uncertain in action and often productive of griping, even when guarded with henbane and given with other aperients, generally requires to be repeated, and in this way time is lost, and the results are often far from being so beneficial as those which follow the action of a grain or two of calomel.

Let it be noted in passing that many of the popular so-called "antibilious" pills notoriously contain mercury as an ingredient, notwithstanding impudent statements to the contrary on the pill-box labels.

It cannot, I think, be doubted that calomel, either alone or in combination with jalap, colocynth, or scammony, constitutes one of the most certain and efficacious purgatives, clearing the entire portal system, producing a large flow of bile in the motions (though not manifestly acting as a strict cholagogue from the liver), and affording a measure of relief to the body unattainable by any other means.

To secure this result is a leading principle in the conduct of the catarrhal state above described. And besides this condition, I would adduce the cases of acute gout and of gouty dyspepsia, which are eminently well treated by calomel at the outset; so, too, many of the recurring congestive troubles of chronic cardiac and pulmonary disease are amenable to the same medication, care being taken to withhold the drug in cases where there is manifest renal degeneration, since, as is well known, mercury is ill borne under these circumstances, and may be mischievous.

Undesirable results would follow if mercury was frequently given in such cases as I have enumerated; but I only allude to the practice of employing it at the outset, and then it should be

given boldly in doses of from one to five grains over night, once for all. In adults a draught may be given on the following morning, containing any suitable saline aperient, such as sulphate of magnesia or Carlsbad salt. This plan leads the way to a simpler or more specific course of treatment in any given case. I am satisfied that in many minor disorders of children nothing can take the place of calomel as a purgative, and much time is often lost by beginning with drugs that are accounted more simple. The only medicine that appears to me to approach calomel in value is castor oil; but this is constantly a source of trouble from its disgusting character.

I find that calomel is distinctly preferable to grey powder as a purgative, just as for other purposes strychnia is to milder preparations of nux vomica. Its action is smarter and more decided. It has also the great merits of being tasteless, and of exciting no nausea, and its bulk is small.

In strumous children, or in healthy ones who suffer occasionally from gastric catarrh, with tenderness and some tumidity of the liver, no medicine is comparable to a purgative containing calomel. After its action a copious bilious stool or two are passed, the tongue is observed to become cleaner, the feverishness pertaining to this state subsides, and the child becomes brighter, and has restored appetite. A so-called simpler treatment with soda or citrate of potash will often fail to yield these results, and so too will repeated doses of rhubarb and senna. The constant failure of "nursery remedies" in these cases must have forced itself upon the minds of most practitioners, and, truly, by the time medical advice is sought the time for the administration of calomel has fully arrived.

I shall not dilate further upon the virtues of this drug in connection with gastric disorders, but may mention that calomel is sometimes of value in cases of chronic catarrh, when given as in an acute case, and in cases of peritonitis with severe vomiting, small doses appear to exert some sedative action upon the intestinal tract.

I would not be understood to urge a return to the old custom of large and frequent dosing with calomel. Nothing could be worse. All drugging is an evil; but when medicine is distinctly indicated we should not fear to use active agents boldly, and so as to produce their effects.

Many hard things have been said about the improper use of mercury, but instances are not far to seek in the practice of most experienced men where aperient mercurial medicine has been taken almost nightly for years without its being possible in common honesty to say that any serious harm had thereby accrued to the individual. The habit is of course a very bad one, but it may be easily broken. In one case I succeeded by

giving bread pills, and in due time declared the fraud to the patient, who had henceforth full confidence in his peristaltic powers.

I venture then to close these remarks with a repetition of the statement I made at the outset, viz., that calomel appears to me to have fallen into unmerited disuse in many disorders, and I desire to put in a plea for the restoration of this drug to a larger sphere of operation, and I am confident that such practice will not only be for the benefit of sufferers, but also for the increased credit of medical art.—*Practitioner, July* 1876, *p.* 1.

108.—NOTE ON PHOSPHORUS PILLS.

By Messrs. ALLEN & HANBURY, Chemists, Plough Court, London.

Whatever the merits, or demerits, of the Pil. Phosphori B.P., it is certain that it has failed to obtain the approval of any large number of prescribers, and is not likely ever to be generally used.

In the absence of any published formula of a thoroughly satisfactory nature, we suggest the following, which, to avoid confusion with an advertised nostrum, for which we believe it to be an efficient substitute, we propose to call Pil. Phosphori cum Sapone:—

℞. Phosphori gr. ij.; carbon. bisulphid. ♏x. vel q.s. solve.

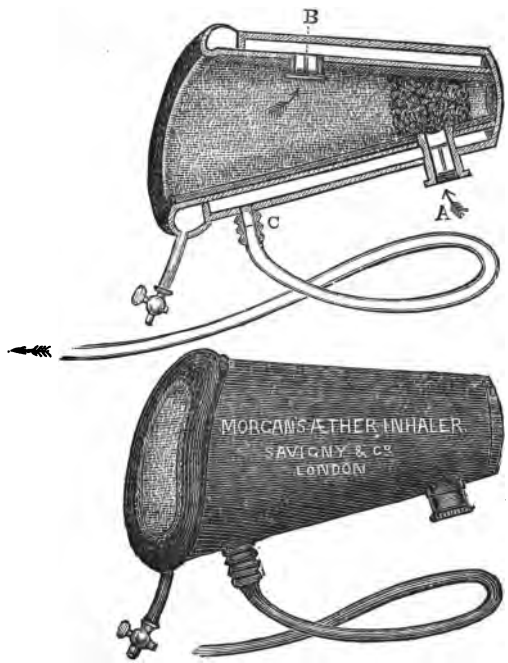
Pulv. saponis dur., pulv. guaiaci resin., āā gr. xxxv.; glycerin. gtt. xij.; pulv. rad. glycyrrh. gr. xij. vel. q.s. ut fiat massa gr. c. To be divided into pills of the strength required, and varnished or "coated" in the ordinary way.

The mass thus formed is of good consistence, easily manipulated, readily miscible with other remedies, and (what is most important) readily soluble. It is hardly necessary to add that the very volatile bisulphide soon evaporates.—*Medical Times and Gazette, May* 20, 1876, *p.* 547.

109.—MR. MORGAN'S NEW ETHER INHALER.

Since the introduction of ether as an anæsthetic, many apparatus have been suggested as a substitute for the felt cone ordinarily in use. One of the objections to this is, that it requires a large quantity of ether to produce anæsthesia; another is, that those who administer it are exposed to the unpleasant effects of its inhalation, especially when often repeated, as in hospital practice; and a third, that in private practice the vapour is diffused through the room in which the adminis-

ɪration is carried on. To overcome these objections, Mr. Morgan, Surgical Registrar at St. George's Hospital, has devised the apparatus of which two diagrams are given, one



complete, and the other in section. The instrument consists of a cone of felt, in the apex of which a piece of sponge is fixed, on which the ether is poured. This is fitted into a case of metal surrounded by an outer one of similar shape, but sufficiently large to leave a space between them through which the expired air can freely circulate before it escapes. There are two valves, acting in opposite directions: one, A, admitting the air, which passes through the sponge moistened with ether; the other, B, through which it escapes into the chamber between the two metal cones. The close application of the instrument to the face is secured by means of the India-rubber cushion, which is filled with air by the tap X, so that all the air inspired must pass through the valve A. The warmth produced by the air which circulates between the two cones prevents the ether

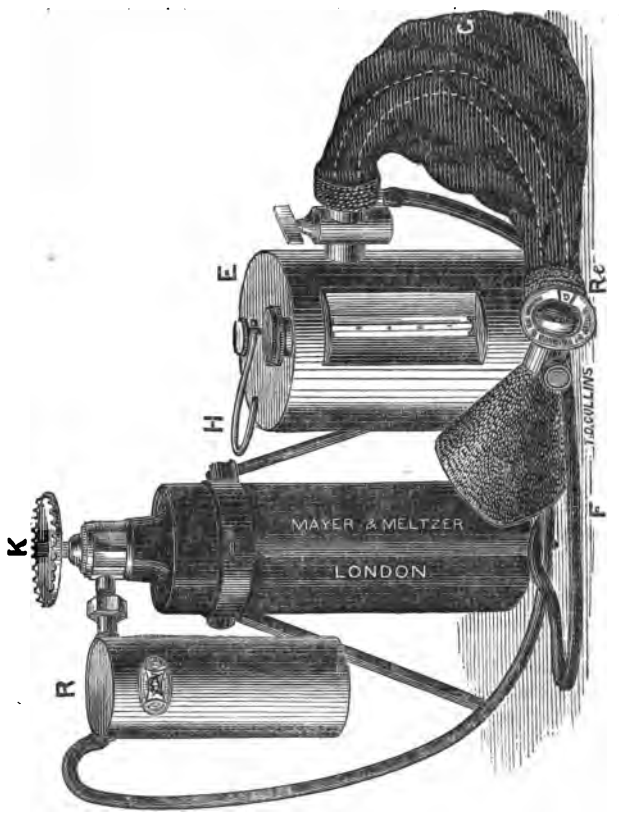
on the sponge from freezing, and the vapour which escapes is carried off by the tube c to any distance which may be desired. The quantity of ether required in this apparatus is much smaller than in the ordinary cone; and the advantage it thus possesses, as well as the safety and freedom from the ether-vapour obtained by the administrator, render it superior to other similar apparatus. Several American surgeons, whose knowledge and experience of ether are generally recognised, have expressed considerable approbation of this invention. It is manufactured and sold by Messrs. Blaise and Co., 67, St. James's Street.—*British Medical Journal, May* 6, 1876, *p.* 567.

110.—ON AN APPARATUS FOR ADMINISTERING NITROUS OXIDE GAS AND ETHER, SINGLY OR COMBINED.

By J. T. Clover, Esq.

For several years, my attention has been directed to the improvement of the way of administering ether. At first, I spared the patient the unpleasant choking sensation of ether by first getting him asleep with chloroform. My next plan was to dilute the ether-vapour with a known proportion of air, the supply of ether-vapour being rendered more uniform by attention to its temperature, which was kept within limits by causing the expired air to pass through the ether-vessel in a kind of worm. I called this the double-current apparatus, and showed it at the meeting of the British Medical Association in London, in 1873. At the same time, I explained the two methods I had used for giving gas preparatory to ether. By the first plan, I simply exchanged the gas-inhaler for the ether-inhaler as soon as the patient was unconscious. By the second, I caused the current of gas to pass through a vessel of ether, after the first three or four respirations of pure gas had made the patient indifferent about its taste. This plan answered very well for cases not requiring more than three or four minutes' anæsthesia; but I found it difficult to supply sufficient air to prevent muscular twitching, without admitting enough to cause a return to partial consciousness.

The apparatus about to be described is, in principle, like the one shown at the Norwich Meeting in 1874, with some improvements. It has been used at St. Bartholomew's, University College, St. Mary's, and the Dental Hospitals; and I have myself placed under the influence of ether with it two thousand three hundred cases. The engraving represents the apparatus, taken out of a leather bag. I prefer keeping it in a tin-box, as the bottle is then fixed ready for use, and there is no need for a tripod.



F. Face-piece. Re. Regulator. G. India-rubber Bag. E. Ether Vessel. H. Hook to attach the latter to a Strap passing round the Neck. K. Foot Key. R. Gas Rarifier.

The apparatus is made by Meyer and Meltzer of Great Portland Street, and consists of a thin bag, oval in shape and fifteen inches long; at one end connected with the ether vessel, at the other with the face-piece. Inside the bag, there is a flexible tube, also connected with the face-piece and ether vessel. By turning the regulator (Re), the patient is made to breathe, either directly into the bag, or indirectly through the tube and ether-vessel. When the letter G is visible, the way

to the gas-bag is open; when the letter E is visible, the only way to the bag is through the tube and ether vessel, so that the more the regulator is turned towards E, the more ether is given, and *vice versâ*. The other vessel contains a reservoir of water, to prevent the temperature of the ether becoming too low. This is to be kept full. The ether vessel is to be rather more than half filled, the precise point being marked against the glass gauge. A thermometer inside this gauge tells the temperature of the ether. Before using it, the vessel should be dipped into a basin of warm water, and rotated until the thermometer stands at about 68 deg. If the room be cold, and if the patient have thin cheeks and large whiskers, the temperature may be 73 deg. It is important that the face-piece should fit closely against the face. Those made by Mayer, of solid leather frame-work supporting a collar of inflated India-*rubber*, are the best, but sometimes they require to be warmed before using.

For giving Nitrous Oxide only.—The regulator is turned to G. The stopcock of the ether-vessel is closed. This vessel is hooked upon the strap round the neck. The strap is adjusted so that the ether-vessel stands at a higher level than the face-piece. The gas being turned on, by rotating the foot-key with the foot, the gas-bag is kept filled as fast as it is emptied by the patient. When the latter breathes out, the supply of gas is stopped; and after the bag is fully distended, the escape-valve opens, and allows the expired gas to escape. If the shape of the patient's face prevent the face-piece from fitting closely, the escape-valve should be closed by pressing it with the finger. Enough gas will escape beneath the face-piece during expiration; but the bag, being slightly distended, will yield the gas so abundantly that no air will be drawn in at the same place during inspiration.

If Ether is to be used without Gas.—The gas-tube should be taken off the ether-vessel; the regulator should be turned to G, and the facepiece should be first applied to the face during an expiration, and be held rather closer during expiration than during inspiration. It is important not to oblige the patient to inhale after the bag is empty, because, the barometric pressure of air on the ether being diminished, the vapour would increase in strength, and make the patient cough, or perhaps vomit. The regulator is gradually turned towards E, and thus the way is opened to the inner tube. The air breathed through it carries vapour from the vessel into the distal end of the bag. As soon as one-half of the air passes through the ether-vessel, the vapour becomes strong enough to cause insensibility in about two minutes, usually without any coughing. As the movement of swallowing is excited by a too strong,

although less pungent, atmosphere than is generally needed to excite coughing, it should be watched for, and the regulator slightly turned back if it occur.

By far the easiest and least unpleasant way of getting a patient ready for a surgical operation is to use gas and ether combined; the gas being given pure during four or five respirations, and the ether gradually added as above described. The supply of gas should cease when the ether is turned on; but if during the operation we have admitted so much fresh air that the patient seems conscious of the taste of the ether, we may, instead of increasing the ether, give a liberal supply of gas until the patient is tranquil. I find less sickness, and less complaint of the taste of ether afterwards, than when ether is used alone. In operations on the eye, the muscular twitching and the panting character of the breathing, during the first few minutes of insensibility, are objectionable; but if the operation be not commenced for five minutes, and the ether given as strong as it can be taken without exciting a cough, the patient begins to breathe stertorously, and now the facepiece may be removed every third or fourth inspiration, and, as the stertor goes off, the eye will become quite steady. I am, however, so well satisfied with a modification of my chloroform apparatus, by which I can give as much of ether or chloroform as I like, that, when I have a choice, I prefer using these for cataract operations, and for the ligature of deep-seated arteries, &c. With respect to vomiting, I think it most important that the patient should have an empty stomach, and prefer that neither food nor drink of any kind should be taken for from four to six hours beforehand. I see least sickness after operations done before breakfast.

In using this apparatus, as in using others, the breathing and the pulse should be kept under observation. Whenever we see a patient swallow, it is probable he is taking the vapour stronger than is necessary, and the regulator should be turned back slightly. If the patient cough violently, remove the face-piece, and be sure that the apparatus has not been overheated, or filled with ether above the proper level. As soon as any muscular twitchings, like those of paralysis agitans, are seen, give about a fourth of an inspiration of fresh air, and do not keep the face-piece quite close to the face till the twitchings have nearly ceased. I have never seen any harm result from the condition which causes these movements. If air were not given, they would increase, and then stop; the respiration would become intermittent, and, some time after this, the heart would cease to beat. The fact that death may be produced, if signs of danger are disregarded, applies to all anæsthetics. Whenever the breathing becomes jerking, sobbing, or inter-

mittent, the face-piece should be removed, but applied directly the breathing loses that character, unless the pulse is much depressed. It is much less important to watch the pulse whilst giving gas and ether than in giving chloroform, but it is desirable; for, when it decidedly loses power, we may safely admit a little fresh air, and thus anticipate the need of removing the face-piece to a greater extent on account of muscular twitching or stertor. If the finger be taken from the pulse to do something else, I would give a little air, unless the patient had only just begun to inhale, or was evidently but slightly under the anæsthetic.

Practical Suggestions.—As the apparatus would be injured by an excited patient taking hold of it, it is as well to be on our guard by having an assistant near in case of need. It is a good plan to place a handkerchief over a patient's eyes, and keep it there till he is asleep, and apply it again when he is about to awake. In operations on the rectum, it is desirable that the bandage required for keeping him on his side should be applied before giving the gas. Sudden distension and bursting of the gas-bag or gas-tube can scarcely happen when the gas-rarefier is used; but if this be not used, or if the gas-bottle have become frozen, it is desirable to warm the bottle, and in doing so the tap end should be more warmed than the other. Whenever there is much difficulty in getting the face-piece adjusted, it may be necessary to arrange a handkerchief or towel, so that the air drawn *in* under the face-piece may be nearly the same as that which was breathed *out*.

In conclusion, the *advantages of the Apparatus* are these:—1. It lessens the waste of ether, and consequently the odour of ether about the house. 2. The patient usually goes to sleep without any struggling, and is ready to be operated on in from one to two minutes. 3. The percentage of ether need not be so high as to produce coughing or swallowing, and it can be made stronger or weaker, as we wish, by merely turning a regulator. Lastly, patients recover rapidly, with less delirious excitement and less sickness, than if ether be given in the usual way.—*British Medical Journal, July* 15, 1876, *p.* 74.

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